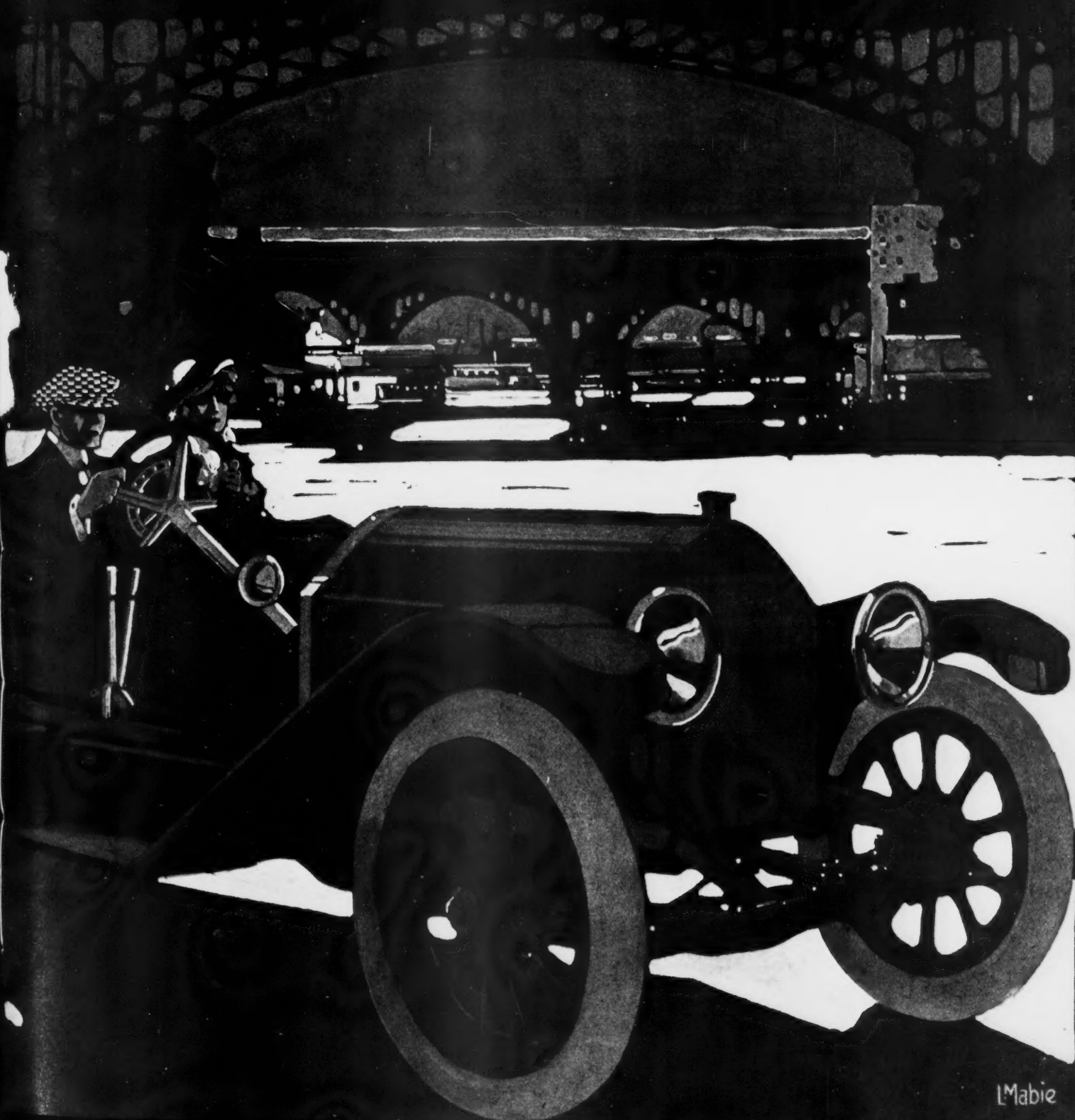
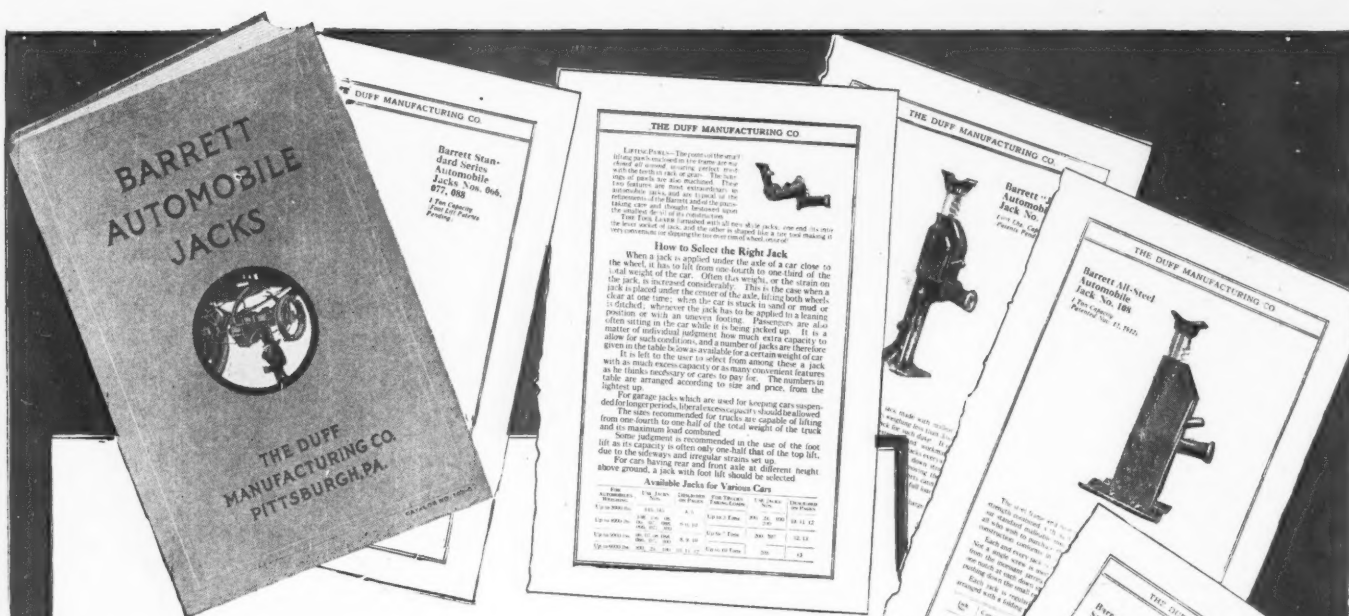


# MOTOR AGE



L'Mabie



Every dealer, every owner, every manufacturer should have this book

*Duff's New Catalog of*  
Genuine Duff-built

# BARRETT

## AUTOMOBILE JACKS

—the most comprehensive and advanced automobile jack catalog ever published. Tells how to select the right jack; how to operate and care for jacks; tables of weights and sizes of jacks for small cars, big cars, trucks and garages. Contains the 1914 Barrett Specifications, and describes the Barrett Standard of guaranteed material and construction. A book filled from cover to cover with illustrations and descriptions of Duff-built Barrett Jacks for every automobile use.

### Jack Wisdom for Duff Dealers

**KNOW** your jacks thoroughly. Often the jack your customer wants isn't at all the one he should have. Suggest the right jack—and tell him why. And the very easiest and best way for you to know automobile jack requirements and how to fill them is to get a copy of this Duff Catalog.

*Write for a number of these books—for your salesmen, your prospects and your counters. They are powerful sales helps and will certainly increase your volume of jack business.*

Let us outline to you our attractive dealer proposition if not already a dealer. Barrett dealers are always identified with the best trade in their communities. Inquiries given full and prompt attention.

**The Duff Manufacturing Co., Pittsburgh, Pa.**

ESTABLISHED 1883

New York, 50 Church Street    Chicago, People's Gas Bldg.  
Atlanta, Candler Bldg.    San Francisco, Monadnock Bldg.

Foreign Distributors: { European Continent—ARMAND D. RIVIERE et CIE,  
Paris, France, Great Britain—WHITE-COLEMAN  
MOTORS, Ltd., Carlow St., Camden Town, London, N. W.  
Canada—Canadian Fairbanks Morse Co.



# MONEY SAVERS FOR MOTORISTS

*Every One Guaranteed to Give Satisfaction*

## THE DAY TIRE VALVE

The Simplest, Most Economical and Efficient  
Tire Valve on the Market

The Day Tire Valve has met with instantaneous success. Since we sent out our first announcement of this valve thirty days ago we have sold thousands of sets. The demand far exceeded our expectations, but we have increased our production to take care of all orders without delay.

The Day Valve has jumped to the front so fast because it supplies all the features motorists have been looking for in a tire valve. It outlasts other valves because of its simple and heavy construction. It is absolutely leak-proof—it is interchangeable without danger of affecting working part—and can be removed for deflation in one-tenth the time required for other valves.

There are no springs or other delicate parts to become deranged. *The Day Valve has but one working part—as against seven complicated parts in other valves.*



Valve Open

The large air passage in the Day Valve makes it possible to pump the largest tire with a foot pump in one-third the time and with one-third the number of strokes, for you don't have to overcome the thirty-pound back pressure of the springs in old style valves.

Get a set of Day Valves today at your dealer or direct from us, 50 cents per set of five. Satisfaction guaranteed or money back.



Valve Closed



Repairs the average puncture permanently at a cost of two cents.

The touring season is on, and you are bound to have punctures and blowouts. Be prepared for the emergencies.

All you need to repair punctures or blowouts in inner tubes is a Tire-Doh Outfit and two hands. Tire-Doh will repair the average puncture in ten minutes at a cost of two cents—and make the repair permanent.

It's easy to use. Just clean around the hole, apply Tire-Doh Cement and fill the gap with Tire-Doh. No heat, no tools needed.

Yes, we know it's hard to believe, but 250,000 Motorists are using it regularly and that ought to convince the most skeptical of its merits.

**Complete Outfit \$1.00**

Satisfaction guaranteed or money back



**Makes Old Lamps  
Look New**

**Silver Quick**  
One Rub  
Turns Brass to Silver

**Brings Old Models  
Up-to-Date**

A bottle of Silver Quick, a piece of cheesecloth and a few minutes rubbing will bring that old car of yours right up to the minute in appearance.

Brass Trimmings are out of date. To be up with the new models your car and lamp trimmings must have a silver finish.

Silver Quick turns brass to silver as if by magic. It deposits a silver finish that will wear for months, requires little polishing and can easily be renewed with another application. It contains no

mercury and is absolutely harmless. For restoring the brilliancy to dulled reflectors nothing equals it.

Get a bottle today—at your dealer or direct.

**Price \$1.00 Per Bottle**

Satisfaction guaranteed or money back.

### 16 OTHER TIRE-DOH PRODUCTS

Every One a Necessity for the Car Owner

Stop that Radiator Leaking. \$0.50	No More Rust Rim Paint...\$0.50	Chemico Blow-out Patch...\$0.50
No-Leak Waterproof Top Dressing ..... .75	Destroy-O Carbon Remover .75	Nu-Stain Top Lining Dye... .50
X-Ray Top Dressing ..... .75	Sta-On Engine Paint ..... .40	Sunshine Metal Polish ..... .25
See-Kleer ..... .50	Body Gloss..... .50	Everwear Nickel Polish ..... .25
Preserv-O Tire Paint ..... .50	Renew-O Leather Dressing .75	Blac-Namel ..... .75
		Metal-Lac ..... .75

Send for our free booklet  
"Keeping The Car New"

**Atlas Auto Supply Co.**

3243 W. Lake Street

Chicago, Illinois

**ATLAS AUTO SUPPLY CO.,**  
3243 West Lake St., Chicago, Ill.

Send me the articles I have checked with an (x), for which you will find enclosed \$.....

Name .....

Address .....

( ) Set DAY TIRE VALVE.....\$0.50

( ) TIRE-DOH.....\$1.00

( ) SILVER-QUICK.....\$1.00

**DEALERS:—Write for Our Big Special Dealers' Proposition**

# Hartford

AUTO COMFORT

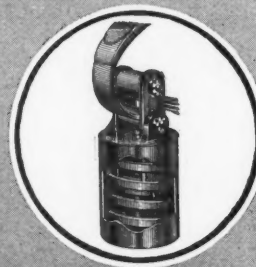
# EQUIPMENT

THE HOME OF HARTFORD AUTO COMFORT EQUIPMENT

Automobile accessories of admitted excellence which contribute to the maximum enjoyment of motoring—each a quality product and a proven factor in promoting comfort, economy and safety.

## Hartford CUSHION SPRING

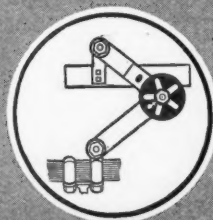
Hartford Cushion Springs insure the degree of flexibility which most automobile springs lack. These comfort-conserving devices increase flexibility and provide for easy riding on average roads just as effectively as Truffault-Hartford Shock Absorbers control excessive flexibility and provide easy riding on rough roads. In combination, these devices offer super-comfort on all roads under all conditions. Hartford Cushion Springs eliminate the continual annoyance and discomfort of travel over small ruts and bumps, car tracks, cross-walks, cobblestones, etc. They are compact and unobtrusive, of the finest material and workmanship, and easily applied to any car. Four Models, \$35, \$30, \$25. Special Ford Type, \$16.



## Hartford Bumper

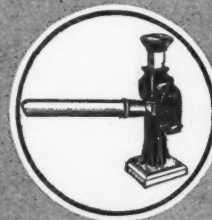
The strongest motor car bumper in the world—no other statement does justice to the Hartford Bumper. A veritable breastwork between car and passengers and the dangers of collision. The four-leaf friction-springs—an exclusive feature—completely absorb the shock and jar.

Saves repair bills by preventing smashed headlights, damaged radiators, twisted mud guards, broken springs, etc. Beautifies the smartest car. Made of staunch metal tubing reinforced with a solidified cement-like composition, combining maximum strength with minimum weight. Attached to any car in 15 minutes. Four sizes—\$15, \$12.50 and \$10. Special Ford Type, \$10.



## Truffault-Hartford SHOCK ABSORBER

The Truffault-Hartford Shock Absorber is the inevitable choice of motorists who give the three-fold problem of greater comfort, safety and economy, the study it deserves. For ten years this standard device has "made good" by making "Every Road a Boulevard." Today a quarter-million motorists enjoy constant comfort through its use. Twenty-five leading makers recognize Truffault-Hartford as "The Pioneer and the Best" by adopting it. Inventive ingenuity earned for the Truffault-Hartford the exclusive right to use the principle of Rotary Friction. Science and results prove that this is the only principle that actually absorbs shocks and vibration. Absolute comfort, lowered upkeep cost and greater safety are logical results. Prices—Five Models—\$60, \$50, \$35, \$16. Special Ford Type, \$16.



## Hartford Auto-Jack

A bright spot in many a wayside stop for repairs is the easy, rapid, efficient work of the Hartford Auto Jack. This handsome tool lifts a heavy car with wonderful ease and quickness. No muscle needed, no back-breaking, perspiring labor—just a simple wrist-movement and up goes the car; a turn of the reversing lever and down it comes smoothly, without jerk. It's all in the gears, ingeniously devised to multiply energy. Made for the motorist willing to pay a little more for something very much better.

Price, \$6.50.

**Guarantee:** "Money back if not satisfactory." Under this broad policy all Hartford products are sold. Any article of our manufacture not proving satisfactory after 30 days' trial from date of purchase, can be returned and the purchase price will be refunded.

**HARTFORD SUSPENSION CO.** E. V. HARTFORD, Pres.  
Main Office and Works, 146 Bay St., Jersey City, N. J.  
**Manufacturers of Hartford Electric Starting and Lighting System**  
Branches and distributors in all principal cities of United States and Canada Dealers everywhere





# MOTOR AGE



Published by the  
CLASS JOURNAL COMPANY  
910 South Michigan Avenue  
CHICAGO ILLINOIS

## YEARLY SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....\$3.00  
Canada and all Foreign Countries.....5.00

All currency should be sent by registered mail.  
Two weeks should be allowed for change of address to become effective, or for receipt of first copy on a new subscription.

In forwarding change of address, please give old and new address.

BEWARE OF SOLICITORS OFFERING SUBSCRIPTIONS AT CUT RATES.

Volume XXV

June 25, 1914

No. 26

## C o n t e n t s

THE BORDERLAND TRAIL.....	5
C. H. Lester, father of the southern route, tells something about the transcontinental link running through the southwest	
EDITORIAL—THE SPEEDWAY COMES INTO ITS OWN—ENGINEERS IN CONCLAVE—THE EFFICIENT CHASSIS.....	12
PHILADELPHIA JUDGE DEFINES RIGHT OF WAY.....	13
Court rules that between street intersections pedestrian crosses at his own risk	
PACKARD GOES 70 MILES IN HOUR AT SPEEDWAY.....	14
Official test of stock cars run at Indianapolis under supervision of Automobile Club of America	
DEATH OF DUCK DECIDES MILWAUKEE TEAM MATCH.....	16
Automobile club defeats Athletic club in interclub reliability run under unique rules	
KLINE AND BUICK SHINE IN UNIONTOWN CLIMB.....	17
Interesting events promoted by Fayette county club	
ENGINEERS MAKE MERRY AT CAPE MAY.....	18
Midsummer meeting of S. A. E. opens at seaside resort	
RECENT EVENTS AROUSE ENTHUSIASM OF RACE FANS.....	20
Packard's hour test causes comment—National expected to race next year	
WHERE TO GO ON THE FOURTH.....	22
Hints for holiday tourists	
MOTOR CAR DEVELOPMENT.....	30
Description of the new Winton and Regal	
TRANSFORMING FORD CARS INTO SPEEDSTERS.....	36
Hints on how this can be done profitably	
INDEX TO ADVERTISEMENTS.....	114

## DEPARTMENTS

Readers' Clearing House.....	34	Among Makers and Dealers....	41
The Accessory Corner.....	38	Brief Business Announcements..	42
From the Four Winds.....	40	New Agency Appointments....	42
Coming Motor Events.....	40	Motor Car Repair Shop.....	44

## "Automobile Row"

"Automobile Row" is ONE street on which the salesrooms of all the important makes of cars are found CONCENTRATED.

On this one street anyone can, at a minimum expenditure of time and effort, obtain almost any information about any car.

"Automobile Row" is one of the first places prospective car purchasers go to compare the merits of the two or three makes of cars they have under consideration.

MOTOR AGE is an "Automobile Row" in book form. In it the advertisements—and advertisements are nothing but salesmanship on paper—of all important makes of cars and accessories are found CONCENTRATED.

In MOTOR AGE any reader can—without having to hurdle aglomeration of underwear and breakfast food ads—obtain almost any information about the best cars and accessories. He can get this information without even leaving his arm chair.

MOTOR AGE is one of the first places prospective car purchasers look for reliable information concerning the kind of car or the kind of accessories YOU are manufacturing.

MOTOR AGE will give you good frontage on its "Automobile Row"—let you a salesroom through which 23,000 interested motorists pass weekly. And here's the kernel—MOTOR AGE will take "The Row" to the motorist; the motorist won't have to come down to "The Row."

**MOTOR AGE**  
910 S. Michigan Ave.  
CHICAGO



## Is the System On Your Car Really Efficient?

Will the starting motor crank the engine easily at all times, in every kind of weather?

Is it so simple that any one can operate it?

Was it tested in the most exhaustive manner before delivery?

Has the manufacturer placed at your disposal a large and capable Service Department?

Is the system backed by an immense organization?

And finally. Has it a National reputation for efficiency or is it "just an electric system?"

# GRAY & DAVIS

## STARTING - LIGHTING SYSTEM

This equipment offers the purchaser *all* the qualities a good system should possess. It is not sold on a basis of "price," but on merit and efficiency. It is exceptionally powerful, knows no weather conditions, and much time and money is expended in testing each unit so that satisfactory service is assured. 74 Service Stations are available to all users.

As for reputation—the Gray & Davis system is known and used wherever automobiles are driven.

**GRAY & DAVIS, Inc.,**

**Boston, Mass.**



proposed routes across the continent, but will candidly state, that by reason of his general knowledge of road conditions and his intimate personal knowledge of all sections of the Borderland route, he is convinced that the Borderland route at this time is a most

landing of the Pilgrims at Plymouth Rock—in fact, the route is a rich field for the romancist, the historian and antiquarian, but it is especially rich for one who wishes to observe the mighty up-building of the civilization of the southwest of today on the site of



UPPER ILLUSTRATION—A ROOM IN THE CASA GRANDE RUINS. BIG JAR HOLDS 45 GALLONS. OTHER ILLUSTRATIONS SHOW PORTIONS OF CASA GRANDE RUINS

practicable route for transeontinental tourists. In the aggregate it offers fewer road difficulties and perhaps the crowning test of its comparative general excellence is the fact that it is rapidly being made better and for some time has been traveled by many tourists and usually with but little trouble.

#### Planning Borderland Trail

For several years since much exploratory work has been done to find a route that would avoid much of the danger and difficulty of the older known routes and that would immediately open an avenue for transeontinental travel better than any then known. In working out this idea some difficulty was met because of the ambition of some communities to be placed on the proposed route, although to do so would lower the general quality of the road; however, the individual ambitions of local communities were overruled where their location was not favorable and the route as charted is claimed to be pre-eminent among transeontinental routes in the following important requisites, namely—in the general good quality of the road, although in common with all western roads there are bad spots, but which are rapidly being made better; because of low altitudes and southerly location it can be traveled during the entire year and is especially available during winter, when other routes are closed; because it passes through centers of wealth and population in the great southwest and in south California, with all the advantages that this assures to the tourist; because the tourist may arrange long or short daily drives to suit his convenience and have hotel facilities each night and, with possibly one exception, at noon; because one always is in close touch with telephone and telegraph communication and usually near railroads;

because water, gas, oil, supply houses and garages are met all along the way—indeed, the writer, who has driven this route from Kansas to San Diego several times, carries nothing in this line except the ordinary desert water bag; because the route in Texas, New Mexico, Arizona and Southern California follows very largely the live county and state highways, thereby assuring to the traveler the best road and best maintenance in that section; because the route is rich in scenic beauty—passes through some of the greatest agricultural, mining and commercial centers of the southwest of today, and tells the story of the Apache and Comanche—of the old Butterfield trail, the Kearney trail and Donophon's drive, the Yuma trail of the days when Yuma was a seaport—the prehistoric civilization, a notable example of which is Casa Grande Ruin—missions that antedate the

the ruins and debris of a dead and obsolete past.

On my recent trip to the south I left Watertown, S. D., on January 6, 1914—a midwinter run from the far north. From Watertown to McPherson, Kan., I followed the Meridian road, which, while usually a good dirt highway, was at that time, because of rain, snow and frost, almost impassable and taxed to the utmost the resources of the driver as well as the stamina of the car.

#### A Trip Over the Trail

Reaching McPherson I turned west on the Santa Fe trail and finally reached the Borderland at Dodge City, Kan., when I followed it south, and although the road was then dry and smooth, traveled slowly until Amarillo, Tex., was reached. At Amarillo I received word to hurry to El Paso. Leaving Amarillo early the next morning we traveled the Borderland



REPLICA OF GROTTTO OF LOURDES AT DEL BAC, NEAR TUCSON



route across those great plains of west Texas to Happy, where we stopped and ate a late breakfast, then continuing we passed on through Plainview and other towns en route to Lubbock. Because of the uniform good quality of the Borderland route from Lubbock west, the projectors of the Southern highway at this point have taken the route of the Borderland and follow it with but little variation westward to the coast. After a fast but rather uneventful day's drive we reached Plains, Tex., where we made our night stop. The next morning we continued westerly across the plains of eastern New Mexico—through the Sacramento mountains of New Mexico for 60 miles, climbing to the altitude of 7,500 feet through the most beautiful scenery and then across the mesa to El Paso.

On this run from Amarillo to El Paso our speed averaged 22.52 miles per hour. After spending some time at El Paso and Deming, N. M., I then continued my trip to California to attend the Santa Monica road races.

#### Crossing the Mountains

The old Imperial being ready to take the road, we left Deming the morning of February 15, 1914. We soon were in Lordsburg, 60 miles away, and then on past the Lordsburg silver and lead mines, through Granite gap of the Steins' Peak mountains and down the San Simon valley to Rodeo, a distance of 50 miles more, where we had lunch. Leaving Rodeo the roads were splendid and we fairly flew past Apache, Bernadino, and around the south end of the Chiricahua mountains—an Apache word pronounced Cherrycow—and on to the great copper smelting city of Douglas, Ariz., 160 miles from Deming.

Filling the car with gas and oil we started over the paved road for Bisbee. We had not gone far before we overtook a motorecyclist going at a fair speed. We gave him the pass signal and he replied by increasing his speed and signaled us to run by if we could—and then the race was on. The way we rushed down that



A CACTI FOREST IN THE SOUTHWEST

road after than grinning imp on two wheels was rather swift. I do not know how fast we meandered as my speedometer did not register above a certain limit. The race was as interesting as chasing coyotes on the plains of Texas, but the pace was too swift, resulting in a hot motor and our friend of the flying two wheels was forced to give up the race and let us go by. He was a reckless sport, but he sure traveled some while he lasted.

As may be guessed we were not long getting into Bisbee, but as we did not wish to run the Tombstone canyon, because of new road work then being done, we swung to the south and west of the Bisbee hills, across the San Pedro river at Hereford, and then over the mesa northwest to Huachuca, where we finished the day's run, having traveled 223 miles at a speed of nearly 24 miles per hour.

#### Through Picturesque Country

We left Huachuca at 8:20 the next morning and quickly passing between the Whetstone mountains and Mustang peak soon arrived at the Empire ranch. Without stopping we soon entered the beautiful Liveoak ravine and rapidly traversed

our way amid its splendid trees, green and flower-strewn hills and little brook, to the summit of the Santa Rita mountains.

Here is suddenly revealed to the traveler one of the prettiest bits of scenery known in all the west. I have seen this gem many times and each time with unabated pleasure; indeed, it is one of those nature pictures that no pen, however able, can describe—created of earth and air and sky by the great Master Artist and of such rare beauty as to baffle the descriptive power or brush of man.

Passing on over the fine state road across these mountains we soon reached Vail and then were traveling fast over the new state highway towards the present metropolis of Arizona—the "Old Pueblo" of mystery tradition and history—Tucson.

#### Scenery Attractive

On this part of the route between Vail and Tucson we plainly could see far to the southward, nestling on the bosom of the Santa Clara valley and apparently at the foot of the towering Tucson mountains, the little volcanic cone, wherein is found the replica of the grotto of Lourdes. And hardby, the great white structure, surmounted by its fine towers of



GIANT CACTI IN ARIZONA



C. H. LESTER CAPTURES "NATIVE SON" OF ARIZONA, A GILA MONSTER



VIEW OF DEVIL MOUNTAIN IN CALIFORNIA

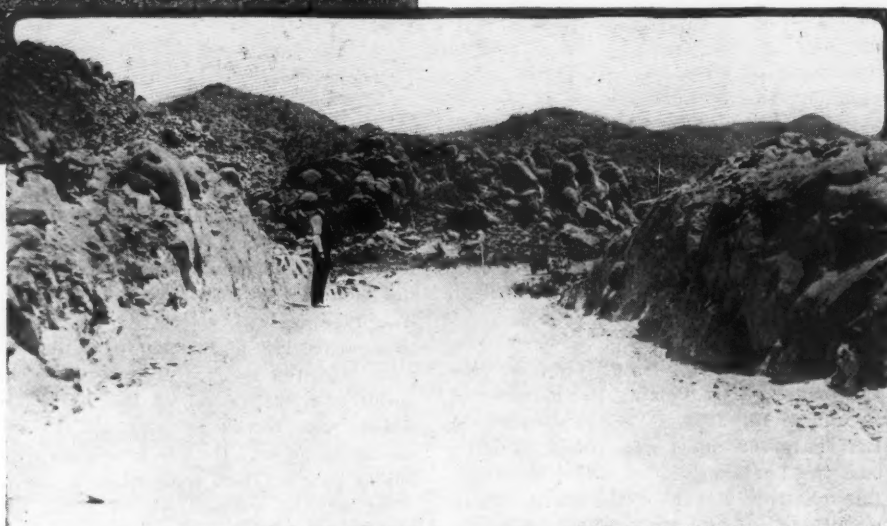
the mission of San Xavier del Bac. In that bloody period of Indian rebellion against the Spanish rule long ago, the Indians of this mission by their valor, fortitude and loyalty to their church teachings, successfully defended their mission against the attacks of the pagan tribes and held it inviolate until the time of the return of the padres. While discharging what to them was a duty of holy trust, they in so doing, preserved to the present age the old mission, noted as being the best preserved of any in the United States. He who visits Tucson should not fail to visit del Bac.

After lunch at Tucson we hurried on through a wonderland of desert vegetation, said to be the most prolific of any in the United States. We soon reached Florence and another fast desert run brought us to the valley of the Salt, with its green fields and flowers, and great herds of high-grade cattle browsing on the rank grass and barley fields.

#### Arrival at Phoenix

Passing on through Mesa and Tempe we stopped at Phoenix—capital of Arizona—for gas and then drove rapidly through the tree-bordered lane leading west from the city. As we drove along the birds were singing and their songs certainly sounded good, when suddenly other birds—great long-necked and long-legged gangleshanks with voices something between a squawk and a grunt and the assurance of the utterly unabashed, came into view—ostriches. According to the last assessment return there are nearly 4,000 of this kind of adult bird in Maricopa county. As I rode by the ostrich farm I could not see why every girl in Arizona should not have a plume. We reached Buckeye at just 7 p. m. and finished our second day's run, having traveled 232 miles at an average speed of a little over 24 miles an hour.

Tuesday morning the roads were wet and slippery from an overnight rain and we had a flat tire. Finally getting away



SUMMIT OF DEVIL MOUNTAIN, NEAR MOUNTAIN SPRING, CALIF.

at 9 a. m. we soon reached a volcanic district where all the landscape showed the effect of intense and recent heat. However, the road was fairly good and we made good time until we reached the Gila river valley, where we found the road slow for several miles because of the deep loose silt and many chuck holes.

#### Traces of Volcanic Heat

We reached Agua Caliente at noon and had to wait until 1 o'clock for dinner or eat canned goods and crackers. We waited and got started again at 1:30. On this day's drive I saw a bit of sarcasm, and very inappropriate, because along these old trails, and especially this old Guma trail, in the old days of wagon travel, the bodies of many men, some women and a few children were left along the way. While driving through this district, which still shows vividly the effect of volcanic heat, and where vegetation is even yet practically non-existent, I saw a neatly-made mound of calcined earth made to represent a child's grave. Large letters arranged in a semi-circle and built of coal black stones admonished the passers-by with, "Don't pick the flowers," and this where the beauty of flowers and the smile of God as expressed therein never was known.

After an uneventful afternoon run we reached Dome, having traveled 157 miles and averaging only 19 miles an hour for the day.

The next morning we left Dome and 1

hour 10 minutes later were in Yuma. We left Yuma at 10:55 and driving northward through the Yuma reserve, soon were on the mesa, and on our way to Black butte. Reaching the butte a short left turn was made and it seemed we were going back to Yuma, but again we turned and were soon in Ogleby. On leaving Yuma we soon entered what was known as the Colorado desert or "The Hollow of God's Hand," a land of low mountains, long level plateaus, enormous

washes of probably prehistoric rivers, and the old sea bed of which the Salton sea is the remnant and the Imperial valley the floor. After a hasty lunch in Ogleby we drove northwest parallel to the Southern Pacific railroad track, passing Glamis, and on to the Mammoth Wash—the place of sorrow for motorists unprepared or unskilled in overcoming sand difficulties.

Between Ogleby and Glamis we can for some distance at the foot of the Walking hills—a chain of hills of pure sand about 50 miles long, 4 or 5 miles wide and from 50 to 200 feet high. Because of prevailing winds from one direction and lack of any binding medium, this body of sand slowly moves forward in one general direction, hence its name.

#### In the Walking Hills

When we reached the entrance of the Mammoth Wash we stopped. On one of the signboards some one had written: "Five miles of Purgatory to pass through; better pray." We prepared the car for the 4-mile wash by the use of fresh water and oil and a slight readjustment to get greater pulling power. As the sand was slightly wet we did not deflate our tires, as an instruction board now directs, but went in on hard casings. Just 23 minutes later we had crossed the wash on intermediate, and reached the east high line canal and were in Imperial valley; then on to Brawley, where we stopped 35 minutes. From Brawley we had very muddy roads, but we smashed



our way through in good time, passing through Imperial to El Centro and then west through Seeley to Dixie Land, on the edge of the desert.

#### Traveling in the Rain

During the day we traveled a district that had proved so heart-breaking to many travelers because of their lack of experience, but for us without difficulty or particular effort, in 8 hours traveling 130 miles. Although it rained hard during the night, the next morning was bright and clear and we left Dixie at 7:10, expecting to drive hard to San Diego and then north along the coast and reach Los Angeles by dark. We let the old car loose and surely traveled some across the desert to Coyote Wells, on through the Devil's Canyon Wash and up the east side of the mountains along the side of the Devil's Canyon, past Mountain Springs and up to the summit.

At the summit we entered a perfect

deluge of rain—a part of the storm that for several days nearly drowned the coast country of California. There were plenty of places to stop, but we decided to carefully go on to San Diego. At times the rain was so heavy that we could not see to drive and were forced to stop. Often the road was covered with water and rushing like a mill-race. Part of the time a high rock wall was on one side and a deep gorge on the other. Believe me, we drove close to the rock wall and kept away from the precipice as far as the road would permit. We made a long stop at Warrens, where we had a good meal, and finally reached San Diego at 4:20 sadly in need of a bath and dry clothing.

Notwithstanding the fierce storm, mountain road and dangerous road condition, because of the storm, we ran from Dixie-land to San Diego in 6 hours 50 minutes, a distance of 109 miles and averaged

over that mountain road in a heavy storm almost 16 miles an hour.

As the roads were destroyed in the north by overflow and bridges out, we left the car in a garage at San Diego and took the train to Los Angeles.

#### Total Distance, 1441 Miles

From Amarillo south and west one crosses much of the plains and all of the mountain and desert part of this trip that is supposed by some to be so difficult; yet if one can run that distance—1,441 miles in 67 hours 45 minutes road time, or travel that distance at an average speed of over 21 miles an hour, the road as a whole must be at least fair.

The Mammoth Wash will soon be only a memory, as a road is building from Yuma direct to El Centro via Holtville, on which the sand will be bridged with plank. This road will not be at all difficult and will shorten the distance between Yuma and El Centro one-half.

## A. A. A. Plans Midsummer Meeting in the Berkshires

### Boosting Good Roads and Touring the Aim

NEW YORK, June 22—Governor Felker of New Hampshire will head the list of speakers who will address the good roads session of the midsummer meeting of the American Automobile Association, to be held at the Hotel Maplewood, Bethlehem, N. H., on the afternoon of July 6. White mountains' visitors generally are invited to attend the highways gathering, which will be in charge of Chairman George C. Diehl of the A. A. A. national good roads board.

State Highway Commissioner S. Percy Hooker of New Hampshire, Lyman H. Nelson of Maine and Charles W. Gates of Vermont will tell of roads development in their respective states. An address which will have some reference to federal aid will be delivered by Paul D. Sargent, the state highway engineer of Maine, who formerly was acting director of the United States office of public roads of the depart-

ment of agriculture. Colonel W. D. Sohler, chairman of the Massachusetts highway commission, also expects to arrange his plans to be present.

The rendezvous at Bethlehem will begin with arrivals on the afternoon of July 3. For the Fourth of July a program of gymkhana stunts, in charge of D. H. Lewis, secretary of the Automobile Club of Buffalo, is being prepared. Sunday, the 5th, will be devoted to short tours to various points in the White mountains; with the meeting of A. A. A. directors and the good roads session on the following day. There will be a scattering of the clans on the morning of the 7th, many having planned supplemental tours into Maine and Vermont.

#### TO REGULATE TOURING LAWS

Montreal, June 22—The differences existing between the regulations of the va-

rious provinces of Canada regarding visiting motorists imposes a great burden on tourists from across the line and a movement will be started shortly to have these regulations brought to some degree of conformity. The burdens that motorists entering Canada from the United States have to contend with can be seen from the following extracts of the regulations of the different provinces:

Ontario—When entering, the car must be registered and a driving license obtained, in addition to securing a bond. If entrance is made by way of Niagara Falls, all these formalities may be completed through one company of that city, which will have all ready upon the motorists' arrival at a charge of \$9.30, including the premium for the bond. The matter legislature, and it is expected that reciprocal arrangements will be enacted.

Quebec—It is not necessary for tourists to secure driving licenses or to have the cars registered, as a reciprocity agreement exists between that province and certain states of the union whereby each mutually recognizes the other's licenses and car registration markers for touring purposes. A bond in double the amount of duty must be taken out. If entry into Quebec is made via Rouses' Point, N. Y., or Alburg, Vt., information can be had from the A. C. A. as to arrangements through a company which has offices in both cities and which is able to assist members to a great extent, registering the car with the United States Government so that the car may re-enter this country without trouble.

New Brunswick—Motorists may tour without securing driving licenses or having the car registered, for a period of 21 days. A bond in double the amount of duty must be taken out.

Nova Scotia—In this province tourists do not have to take out licenses, provided that they have complied with the requirements of the law in their home state.

Prince Edward Island—Restrictions are so stringent as to render touring practically impossible.

Alberta—The province grants tourists 20 days' exemption.

British Columbia—This province grants tourists 60 days' free use of the roads.

Manitoba—This province grants tourists 30 days' free use of the roads.

Saskatchewan—This province grants 30 days' free use of the roads when the tourist comes from a state where the courtesy is reciprocated.



MISSION DEL BAC, A BORDERLAND TRAIL FEATURE



# Police Chiefs Frown on Reckless Driving of Cars

## International Association Discusses the Motor Problem

MILWAUKEE, Wis., June 22—A national campaign against reckless driving and motor speeding will be put under way at once by the International Association of Police Chiefs, according to John T. Janssen, chief of police of Milwaukee, who was elected president of the association at the annual convention held in Detroit last week. Chief Janssen believes the same methods introduced in Milwaukee, which have greatly minimized the speeding evil, can be used in other cities and he will act as prime mover in the campaign. The plan is to pass a universal speed and traffic regulation law throughout the United States, by congress, if possible.

Milwaukee motorists are pleased that such drastic regulations as were proposed by members of the association at the Detroit convention are not likely to be invoked because Chief Janssen is heading the movement. Mr. Janssen does not believe in drastic measures, but rather in education and suggestion. He frowns on suggestions such as made by Chief David Wolff of Yonkers, N. Y., who would not permit any manufacturer of motor vehicles to put out a car that can be driven in excess of 30 miles per hour. Chief Wolff also recommends that a locking device be installed on every machine, one for 15 miles per hour and the other for 30 miles per hour as maximum speeds. At all lines of demarcation he would station traffic officers equipped with master keys to shift the proposed car locks from the low maximum to the high maximum, as for instance, at the city limits or boundaries. Car owners will not be given a key, so that the police will have absolute control. Mr. Wolff, however, did not offer a suggestion as to how the enormous number of cars passing city boundaries in the various cities of the country are to be handled expeditiously or without great loss of time consumed by officers turning the key.

Chief Janssen of Milwaukee is now mapping out a campaign and will offer it to a special committee of the association later.

### OHIO AFTER ROADS LEADERSHIP

Columbus, O., June 22—From third to first place among the states of the union in mileage of improved roads will be the record of Ohio in a few more years, if the present road program is continued. And there is no expectation of its not being carried forward at its present rate and even enlarged upon. The two states surpassing Ohio in percentage of improved roads are Rhode Island with 49.1 per cent; Massachusetts with 49 per cent; Ohio has 34 per cent of its highways improved.

Among statistics given out by the state

highway department are many of interest to all. They show that the state has 83,700 miles of public roads outside of municipalities, 28,413 miles of which are improved; 11,000 miles of streets, 6,360 of which are improved.

Since the organization of the state highway department in 1905 the department has let contracts for improving 676 miles of road. The number of miles contracted for since November 15, 1913, is 103.7 miles. The department expects to improve more than 500 miles before the close of 1914. Counties having more than 10 miles of state-aid roads are: Franklin, 13.8 miles; Greene, 16.3 miles; Mahoning, 11.8; Portage, 23.6; Richland, 15.9; Tuscarawas, 13.2. All counties have macadam roads, twenty-nine have some concrete roads and thirty-nine counties have built some brick roads. The average Ohio county has 54,172 population; \$76,353,056 tax duplicate; 290,056 acres of taxable real estate; 951 miles of public roads; 32 miles of improved roads; 107 miles of inter-county roads.

Cuyahoga county leads in brick road mileage with 172 miles; Huron county in concrete roads, 16 miles; Allen county in macadam roads, 725 miles; Dark county in gravel roads, 1,024 miles; Muskingum county in road mileage of all sorts, 1,627 miles. The inter-county highway system embraces 9,400 miles and main market roads 2,392 miles.

### INDIANAPOLIS PLANS SHOW

Indianapolis, Ind., June 15—A motor show will be held at the Indiana state fair, just north of the city, by the Indianapolis Automobile Trade Association. The fair will be held 1 week, beginning September 7, and usually attracts thousands of visitors from all parts of the state.

It has not been customary for motor car and allied concerns to exhibit extensively at the fair on account of lack of space. This will be solved by using the immense tent in which the association held a show in town in the spring of 1912. The tent will be reserved exclusively for exhibits of members of the association.

A very successful motor show was held by the association this spring. There has been talk for several weeks of a fall show and definite action was taken at a meeting of the association on the evening of June 10. The vote to hold the show was unanimous.

### LITTLE GLIDDEN ROUTE OUTLINED

Des Moines, Ia., June 20—Hal R. Wells of Des Moines, vice-president of the Iowa Automobile Association, has completed the pathfinding trip for the Iowa Little Glidden tour which will be run on July 1, 2

and 3 from Des Moines to Sioux City. Arrival in Sioux City will be on the night of the 3d and the tourists will be there in time for the big races at the Sioux City speedway on July 4. Special arrangements are concluded for the care of the Little Glidden party both in the city and at the speedway, where a big section of the parking space is reserved.

The pathfinder designated Iowa Falls as the noon control for the first day of the run. Clear Lake will be the night stop of the first day. On the second day the tourists will lunch at Algona and the night stop of the run will be at Spirit Lake. The noon control for the third day will be at Storm Lake and the run thence will be to Sioux City on the last afternoon of the tour. From Sioux City the party will return to Des Moines at will. Spirit Lake and Clear Lake both are making elaborate preparations for the entertainment of the party. There will be music, bathing, boat rides, dancing and refreshments for the tourists at both places.

### ROAD TO MT. VERNON PLANNED

Washington, D. C., June 20—The construction of a boulevard extending from this city to Mount Vernon, Va., where is located the tomb of George Washington, seems near at hand. A plan to raise \$10,000 as this city's contribution to the fund for building the road has been started. In addition to this the federal government will contribute \$45,000, provided a like amount can be raised from other sources. Alexandria county, Va., is said to be willing to donate \$25,000 to the fund and the cities of Washington and Alexandria are expected to raise the balance of the \$45,000 required. The boulevard will be 18 feet wide and about 18 miles in length. Various civic associations in the two cities are working on the project.

### MOVIES ILLUSTRATE SALESMANSHIP

New York, June 22—Having handled weighty problems during its meeting of the past season, the Electric Vehicle Association of America banished all seriousness at its closing session last Friday evening, held in the auditorium of the New York Edison Co., New York city. The program was a light-weight and interesting affair from start to finish and the big hit of the evening was a two-reel "movie"—"Selling Electric Vehicles."

In the films the characters were men prominent in the association and the audience happily followed the big merchant's solution of his horse haulage problem by the installation of a fleet of electric. The association co-operated with him and helped him work out the answer. The

film was donated by the Edison Storage Battery Co., the scenario being by Stephen G. Thompson, of the Public Service Electric Co. of New Jersey. The part of the merchant was taken by J. F. Becker.

The films are to be a feature of future electric development work. They will be supplied to any accredited electric association and even now have started on a circuit. They will be shown at the convention in Philadelphia, October 19-20-21.

About the only business was a report that the membership in the association has grown from 437 last October to 762 now and that from one organization a few months ago there now are branches in New England, Chicago, Philadelphia, Washington, D. C., Cincinnati, San Francisco, Los Angeles and Pittsburgh.

### CARNATION IN FUEL TEST

New York, June 19—A 24-hour non-stop run was completed by a Carnation car on June 18. The little car went 374 miles and averaged 29 miles to the gallon of gasoline at an average speed of a little over 15 miles an hour. The course was from Forty-sixth street to One Hundred and Tenth street and from Fifth avenue to Broadway.

### MISSOURI GAS PRICES DROP

St. Louis, Mo., June 22—The Standard Oil Co. of Indiana, still doing business in this state on "its good behavior," made its sixth cut this week in the prices of its products during the six months it has been operating in Missouri in an effort to quash out the independent trade. The last cut on gasoline was 1.1 cents per gallon, the price tumbling from 12 cents to 10.9 cents. Coal oil dropped from 6.5 to 5.9 cents per gallon while naphtha was cheapened 1.1 cents a gallon, dropping from 10 to 8.9 cents.

Since the Indiana concern was permitted to return to the state by a ruling of the supreme court, it has reduced the cost of gasoline 6 cents and coal oil 3 cents, and these cuts were met in almost every case by the smaller and independent dealers throughout the state, which number about thirty. The Standard refineries are at Wood River, Ill., and the price of oil in East St. Louis on the same side of the Mississippi is 11.5 cents a gallon.

### CYCLECAR RELIABILITY BILLED

New York, June 22—Encouraged by the successful results of the cyclecar competition, which he ran off at Tenneek on June 13, Dr. Charles G. Percival, president of the Cyclecar Club of New Jersey, has decided to conduct a 350-mile reliability run from Newark, N. J., to Philadelphia and Atlantic City on September 6, 7 and 8.

### INTERSTATE COMMERCE POINT

Wilmington, Del., June 16—A test of one phase of the Delaware motor vehicle law is being made through a case brought against two chauffeurs employed by the

P. E. Sharpless Co., which has three dairy products factories in Pennsylvania and brings practically all of its products to Wilmington in 4-ton motor trucks for shipment to Philadelphia by boat. It has no Delaware trade and claims that it is exempt for that reason, from Delaware license, through the reciprocal clause in the state law, and it operates its trucks, which makes four trips a day to Wilmington on Pennsylvania licenses.

Delaware authorities evidently believe that the company should pay a Delaware license for the operators of the cars are under prosecution in the present case, charged with operating cars in Delaware without a license, on the ground that the company is making a regular business of bringing its products here. The cases are before the city court. They were partially argued last Saturday. The argument will be completed on June 23.

Philip L. Garrett, counsel for the defendants, claims that the trucks are not required to carry Delaware tags, in view of the fact that the state accords the same privileges to Pennsylvanians that Pennsylvania accords Delawareans, and that is to permit them to come in free on tags of other states, except in cases where they do business here, and he claims his clients are not doing business in Delaware but are merely engaged in interstate commerce when their trucks come into the city.

The court therefore has two points to decide; the extent of the reciprocal clause in the state law and whether the company is doing business here or merely engaged in interstate commerce. Mr. Garrett bases the latter contention on the fact that as

Delaware reciprocates all privileges accorded by Pennsylvania it also must include the phase of the Pennsylvania law which exempts all foreign corporations except those doing business in the state.

### URGE GOOD ROADS IN SOUTHWEST

Big Springs, Tex., June 20—Delegates from nearly all the counties on the route of the proposed motor highway that is to be constructed between points in Colorado and the Gulf coast of Texas attended the recent meeting of the Colorado-to-the-Gulf Highway Association which was held here.

At the meeting of the association here, fourteen counties paid their fees of \$100 each as members of the association. A resolution was adopted to the effect that the western division of the Colorado-to-the-Gulf highway should become a part of the national highway known as the Puget Sound-to-Gulf, beginning at Seattle, Wash., and having termini at Corpus Christi and Galveston.

### CHANGES IN PULLMAN COMPANY

York, Pa., June 22—Thomas C. O'Connor resigned as president of the Pullman Motor Car Co. and H. W. Hayden, of Detroit, recently connected with the Overland in Detroit and Milwaukee, has been made the new president of the company. Oscar Stevenson remains secretary and treasurer of the company.

The Pullman company is under contract to start July 1 building 5,000 LaVigne cars, for the LaVigne Motor Car Co., of Detroit, which must be completed within a period of 8 months. This work and the building of Pullman cars will keep the plant running day and night.

## Protests Freight Rate Change Plan Chamber Investigates Proposed Increases

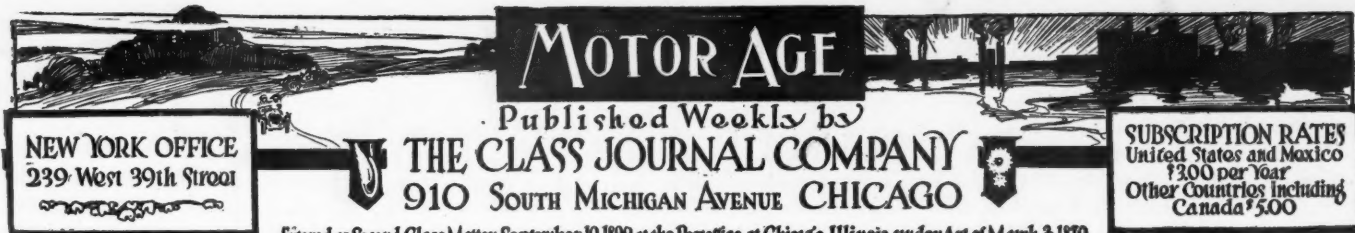
NEW YORK, June 20—Two plans that would materially increase freight rates on motor cars are being considered by the official classification committee of the railroads in New York city. One relates to a proposed packing requirement on polished sheet iron and steel, while the other is an effort to charge the weight of blocking used in fastening motor cars in freight cars at the rate applicable to machines when a single car is shipped.

Strong opposition is made to the suggestion that polished sheet iron and steel, United States standard gauge No. 20, or thinner must be packed in metal cases with wooden covers for shipment. The method of shipping this material has been to place a pile of sheets in each corner of a box car and hold them in place by proper arrangement of 2 by 4 timbers. It is of this sheet steel that many parts of motor cars are manufactured, such as bodies, hoods, fenders, drip pans, etc., and it is estimated that the industry consumes from 50,000 to 75,000 tons annually, which

is a very considerable proportion of the total production of polished sheet steel. If the railroads adopt the requirement that this material must be boxed for shipment it is estimated that \$6 to \$8 per ton will be added to the cost to motor car manufacturers, or a total of something like \$500,000 per year. The National Automobile Chamber of Commerce appeared at the railroad meeting and strongly opposed the suggested change.

Another matter which the chamber opposed at this meeting is the suggestion that the weight of blocking used in fastening motor cars in freight cars be charged for at the rate applicable to the machines when a single car is shipped. As the classification of such shipments is two and one-half times first class and as the blocking weighs as high as 200 pounds in some cases, the proposed ruling would add materially to the cost of shipping and unjustly so, inasmuch as this blocking is used to protect the machines from damage during transportation.





**MOTOR AGE**  
Published Weekly by  
**THE CLASS JOURNAL COMPANY**  
910 SOUTH MICHIGAN AVENUE CHICAGO

NEW YORK OFFICE  
239 West 39th Street

SUBSCRIPTION RATES  
United States and Mexico  
\$3.00 per Year  
Other Countries including  
Canada \$5.00

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

## The Speedway Comes Into Its Own

**I**MPORTANT as was the demonstration of the Packard company Saturday when one of its stock cars covered a distance of more than 70 miles in 1 hour, as great an achievement is the mere use of the speedway for such demonstrations. As long as the Indianapolis motor speedway was employed solely as a stage for the annual 500-mile race, just that long did it fall short of its capabilities and of the purpose for which its originators planned the brick oval.

**W**HEN Carl Fisher conceived the idea of a speedway at Indianapolis, the thought of a race track was a secondary one. His original purpose was to provide a place where American manufacturers might test their product. It was conceived at a time when there was no place in America aside from dangerous dirt tracks and one or two straightaways where speed tests might be held. With the speedway there for their tests, car and accessory makers have failed to take advantage of the opportunity it offers.

**E**XCEPT for certain of the Indianapolis manufacturers, even the car makers themselves seem to share in the general impression that the speedway is only for the Memorial day race and its preliminary practice. True, some of the Indianapolis makers use the brick oval as a testing ground, but it is much in the same way as they take the cars out on road tests. Packard's hour speed trials were the first of the sort which have had official supervision, with the exception of the semi-official tests of Harroun's carbureter, supervised by Motor Age.

## Engineers in Conclave

**T**HE Society of Automobile Engineers in annual summer session at Cape May this week is closer to the car buyer than the majority of the buyers realize, and although engineering topics in which the layman is out of his sphere are discussed, it still remains a fact that the work that the society is doing is very close to the car owner and the driver-owner.

**T**O the Society of Automobile Engineers belongs not a little of the credit of facilitating production in the manufacture of cars as well as in the matter of reducing price. One of the greatest works of the S. A. E. has been that of standardization and in all of this work the car owner has been kept foremost in mind. A few examples will suffice to illustrate this:

**O**NE: By standardizing magneto dimensions the owner now can change magnetos at will without having to make any changes in the supporting bed plate or in the position of the drive shaft, whereas before the engineers took the matter up, some magnetos had larger bed plates than others and to change a magneto meant a redesigning of part of the crankcase, with re-arrangement of magneto driveshaft. Two: Carbureter flanges, gasoline feed pipes and control connections have been so standardized that now you can change from one make of carbureter to another without having to buy a new intake manifold. Three: Today a truck owner using one make of solid tires can change to another make without purchasing a new set of wheels, yet before our engineers wrestled with the question it meant a new set of wheels when you changed from one make of tires to another.

**C**HIEF among the functions of the famous oval at Brooklands, England, is its use for official time trials and speed tests. The engineers of English car factories utilize the Brooklands track as a part of the factory testing laboratory. The long-distance time trial to the European maker is the crucible in which the product is given its supreme and final test. These trials at Brooklands are all under official supervision and the records established are accepted without question.

**T**HERE is no reason why the Indianapolis track should not be utilized in the same way and with results that would be beneficial to the industry and perhaps be instrumental in recovering for this country the laurels which have gone abroad for the second time. It was not through one 500-mile race and a few scattering events throughout the country, interlarded with excursions on the dirt-track circuit, that Europe developed the Peugeotts and the Delages that humbled America's prize-winners; it was through consistent and studied experimental work on Brooklands and similar speed courses. It is only by like means that America can hope to develop mechanisms that will show Europe their heels.

**N**OW that the Packard company has broken the ice it is only reasonable to expect that its demonstrations will be followed by similar speed trials by other manufacturers. There has been so much misstatement and so little really dependable information as to the speed capabilities of American stock cars that the inauguration of official stock car trials is welcomed.

## The Efficient Chassis

**I**NDIANAPOLIS offered us an excellent example of what a little motor of 183 cubic inches can do in a 500-mile race, and America is asking for some of these little motors in our chassis. The story is not all with the motor, but takes in the complete chassis as well. The little motor will do its part, but if the chassis is not an efficient factor in the car the sum total of performance will not be up to expectations. In other words, if you put a good motor of 183 cubic inches in a well-made chassis it will average 90 miles per hour for a lap of the speedway but if you put this same motor in a poorly-made or ordinary chassis you may show only 75 miles per hour.

**T**HE motor is not all. It will do its part, but the entire chassis must be brought up to standard. The question naturally arises as to what means can be used to improve the chassis. This is a long engineering story. The accuracy of workmanship in the gearbox is one example. The shafts must be stout, short between bearings and with bearings perfectly mounted so that not an ounce is lost in friction. The same applies to the rear axle. The housing must be stout and rigid to form a proper bearing for the differential and the drive shafts. The bevel gears must mesh perfectly, parts must be balanced, and every detail in lubrication taken care of. You can go further and put the scientific engineering searchlight on the position and arrangement of the universal joints so that there is a minimum loss of power. Coupled with this is the arrangement of the torque member, the radius rods, if used, and the general suspension of the car.



# Philadelphia Judge Defines the Right of Way

## Between Intersections Pedestrian Crosses Street at Own Risk

PHILADELPHIA, Pa., June 19—A judicial opinion of much interest to both the motorist and the pedestrian as to the respective rights of each on the highway was rendered yesterday by Judge Sulzberger in refusing a new trial to a chauffeur who had been convicted of involuntary manslaughter and sentenced to 6 months in the county prison with a \$250 fine attached thereto.

While stating that the streets are primarily the property of the people the judge admitted that the introduction of the motor car has injected a new element into the regulations governing the rights and duties of the pedestrian and the vehicle driver and handed down some advice for the protection of both.

In refusing a new trial to the convicted chauffeur the court said:

Unfortunately, the decedent must have seen the defendant's car descending upon her at the same moment the defendant saw her. Instinctively she stepped back to avoid it and thus stepped into the new track taken by the defendant's swerving. Her death resulted. The defendant thinks that under these circumstances decedent's death was an unavoidable accident.

The term "unavoidable accident" has been much abused of late. It seems often to be applied to the result of the collision rather than to its cause. Criminal selfishness may manifest itself in many ways. Not the least incentive to its exercise may be found when one of the powers of nature has come into the control of men unaccustomed to wield it.

This is the case with the motor car. A large number of persons suddenly have felt the sense of superiority which power beyond the common stimulates in man. They cultivate a feeling of superiority, not unmixed with contempt, for those who merely walk. Such a feeling leads to more or less disregard of the rights of pedestrians.

The chauffeur and his master tend to view the foot passenger at a crossing as an interloper who interferes with their legitimate progress. This view of the subject is manifestly imperfect.

The streets are the property of the people. By long usage they have been divided into footway and cartway, with crossings at reasonable intervals. The cartway was used by vehicles drawn mainly by horses. Long experience has enabled us to formulate rules for the satisfactory regulation of this traffic. The comparative speed of human walking and horses trotting has been the basis of this legal adjustment.

The substitution of mechanical traction for animal traction has raised a question very different from those that arose before. Motor cars virtually are locomotives on city streets. The relatively few locomotives on city streets which were used before the coming of motor cars were used by the railroad companies. Railroad locomotives, however, run on rails constituting a well-defined track. Their danger can be fairly well guarded against. Their number, compared with the traffic of a city, is insignificant, and they rarely run through the most frequented streets.

Motor cars are absolutely different. In a short time they practically have displaced horses for ordinary traffic. It is necessary to meet these new conditions. We cannot do so by viewing the motor car as if it were a carriage drawn by horses. The cases defining the relations of foot passengers to horses are essentially different from those which subsist between foot passengers and motor cars. The main fact in this new condition with which we are confronted is that locomotive engines capable of attaining high speed are traveling up and down our streets along any lines the drivers may select; that they not only run both ways in several lines, but that they turn corners from cross streets and thus heighten the intricacy of the problem and the danger of the pedestrian.

Assuming the average speed of this host of vehicles to be but 15 miles an hour, it would follow that they run six times as fast as the average person walks. If a person

desires to cross a 26-foot cartway at a street crossing he is liable to be run down by a motor car turning the corner or by one which was more than 150 feet away from him as he started. It was well known that many drivers run more than 15 miles an hour, that 20, 25 and even 30 miles are not uncommon rates of speed on our streets. The substitution of mechanical traction for animal traction is one of the greatest of modern improvements, being worthy to be compared in importance with the introduction of railroads and steamships. It is absolutely necessary, therefore, to adjust ourselves to this new phase of modern life.

THE FIRST CONSEQUENCE IS THAT THE ANCIENT RIGHT OF THE PEOPLE TO CROSS A CITY STREET AT ANY POINT MUST BE QUALIFIED BY THE DOCTRINE THAT BETWEEN CROSSINGS THE RIGHT OF WAY BELONGS TO THE VEHICLE AND THAT THE PEDESTRIAN MUST RECOGNIZE THIS AT HIS RISK. There is, however, a second consequence. Streets must be crossed and there must be a reasonable provision for crossing them in safety. Therefore, we must recognize the intersection as such crossing point. At such intersections the pedestrians must have the right of way and the driver of the vehicle must recognize this right at his risk. The result is inevitable that occasions arise when in order to save the lives or limbs of foot passengers the motor car must stop. It is this view which the defendant combats. He complains that the trial judge erred in this regard, and his argument is finally reducible to the contention that the driver of a motor car always has the right of way and therefore that he does his whole duty when he manages his going car with reasonable care and prudence. This involves the proposition that he need not under any circumstances stop his car.

The offense with which we are dealing is one of a new class, and its perpetrators have not yet realized its gravity.

There are cases in which a motor car driver may by such homicides incur a much greater degree of guilt than involuntary manslaughter. Under certain circumstances voluntary manslaughter, and even murder, may be the proper verdict.

The malicious projection of a death-dealing machine, whether it be a bomb or a motor car, into a crowd of people would doubtless be murder.

### HOLDS RIVER NOT AN OBSTACLE

Milwaukee, Wis., June 20—The supreme court of Wisconsin has reversed the decision of the circuit court in the case of F. Felix Wettengill, Appleton, Wis., against the United States Lloyds, involving a claim for damages for injury to Mr. Wettengill's car, which ran into a river while being driven by another than the owner. The decision is of wide interest because of the principle of liability insurance involved.

Mr. Wettengill insured his car in the Lloyds against loss or damage by fire and theft, with a rider that in consideration of the payment of an additional premium, he would be insured against damage by collision, "excluding damage caused by striking any parts of the roadbed, rails or ties of any street, steam or electric railway." One evening Mr. Wettengill permitted his brother-in-law to use the machine. He was speeding it on a road near Green Bay, Wis., and was unable to make a sharp turn. The road runs parallel to East river and at the curve the car shot from the road and down an embankment into the stream. The driver drowned.

Mr. Wettengill was refused payment of damages on his claim under the collision

rider and brought suit to collect damages. He claimed the river was an obstacle or object of collision and the circuit court upheld his claim and awarded him damages. The Lloyds concern appealed the case to the state supreme court, which has handed down a decision reversing the circuit court on the ground that the accident to the car was not such a collision as was contemplated by the policy, and Mr. Wettengill therefore had no grounds for claim for damages.

It is possible that Mr. Wettengill will appeal the case to the next higher court and if so, the decision will be watched with much interest.

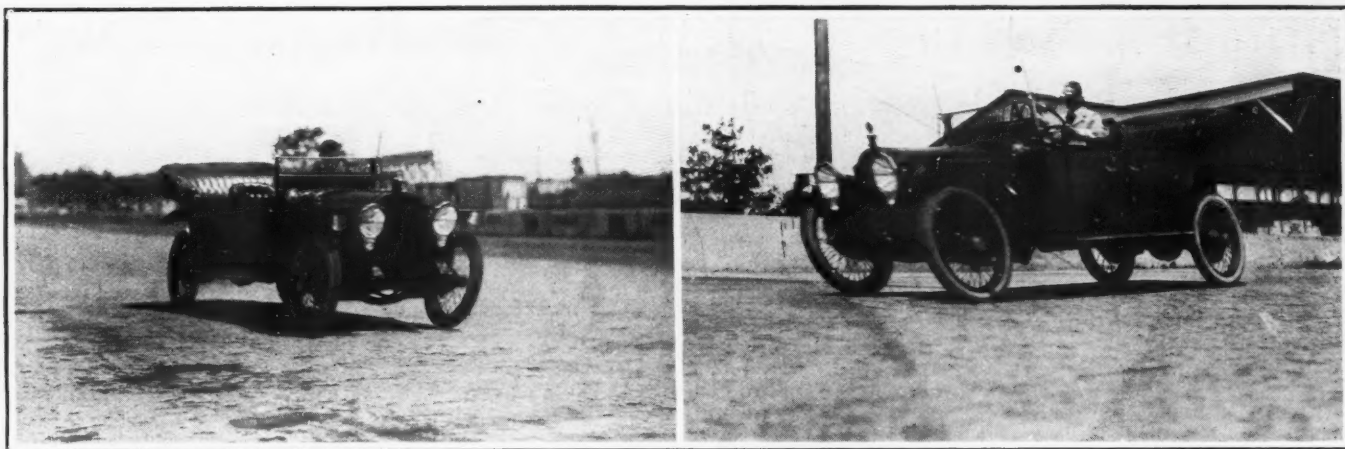
### DECREASE IN FATALITIES

New York, June 20—Fatalities due to motor cars have decreased in the city of New York, according to statistics compiled by the National Highways Protective Society. During May forty-five persons were killed in the streets. Of these, twenty-one, or 46½ per cent, were struck by wagons; 19, or 42 2/9 per cent, by motor cars, and five, or 11 1/9 per cent, by trolley cars. Thirty-two of the forty-five were children and of the twenty-one killed by wagons sixteen were children, and of the nineteen killed by motor cars fourteen were children. While the total has shown a decrease the infantile fatalities have increased.

Car drivers, states Secretary Edward S. Cornell, are paying better attention to traffic rules than are drivers of horse-drawn vehicles. In New York state, outside New York city, motor cars killed fifteen, trolleys four and wagons 3 in May. At railway grade crossings in the state nine were killed and ten injured, five of the nine were pedestrians. In New Jersey motor cars killed seven, trolleys three and wagons one.

### HORN MUST BE SOUNDED

Detroit, Mich., June 21—When a motor car and a horse-drawn vehicle are going the same way and the motorist wants to pass the other vehicle, he must sound his horn or give some warning of some kind before going ahead. This is practically what Judge Dromgole, of the Essex county general court, said in a decision rendered in the case of Charles F. Tapping, a farmer of Gosfield South, Canada, against Charles H. Fuller, a motorist from Union, Canada. On a dark night the farmer and the motorist were traveling in the same direction on the same road and the motorist without warning sped by the farmer. The latter's horse became frightened, ran away, damaged the farmer's wagon and itself. The court ordered the motorist to pay \$350 damages to the farmer.



THE 5-48 PACKARD COMPLETING ITS HOUR RUN

THE 3-38 PACKARD ENTERING THE LOWER TURN

## Packard Stock Car Goes Over 70 Miles in 60 Minutes

Official Hour Speed Trials Under Supervision of Automobile Club of America

INDIANAPOLIS, Ind., June 20—A Packard stock touring car covered more than 70 miles in a 1-hour trial at the motor speedway today, settling definitely the ancient contention that no stock touring car is capable of speed of a mile a minute. The car that made the 70-mile run in the hour was a new Packard 5-48. To clinch the argument on the mile-a-minute question, a Packard 3-38 covered over 62 miles in the hour.

The hour trials were held under the supervision of the Automobile Club of America at the request of the Packard Motor Car Co. of Detroit, the cars being officially timed by Herbert Chase of the A. C. A. and the stock status of the cars determined by him. The trials were opened by J. G. Vincent, chief engineer of the Packard company, in the 3-38 phaeton, but after running three laps at an average of 62 miles per hour he stopped because of a broken water pump.

### Consistent Running

W. R. McCulla, assistant research engineer of the company, then started out with the 5-48 phaeton, for a 1-hour run, with the intention of maintaining a speed of just over 70 miles per hour. The run was completed on this schedule without stop, the exact distance covered in the hour being 70 miles, 2,362.8 feet or 70.447 miles. A feature of as great importance as the total distance covered was the consistent running of this car. Only three laps averaged less than 70 miles per hour and none were less than 69.7. The fastest lap was the last lap, which was made at an average speed of 71.2. It speaks volumes for the condition of the car at the end of the run that it could be opened up to this speed after its 60-minute grind.

After the conclusion of this test, McCulla took the wheel of the 3-38 phaeton, which had been fitted with a new pump meanwhile. Its showing on this trial was as good as that of its larger mate, a dis-

### By Darwin S. Hatch

tance of 62 miles, 2,244 feet being covered within the hour, or 62.425 miles per hour for the 60 minutes. One stop of 1 minute 5 seconds was made after running 47.5 miles, to take on oil. This made one lap drop to a speed of 39.4 miles per hour. Aside from this one lap the slowest one was 63 miles per hour. Like that of the larger car the fastest lap was the last lap, which was made at an average of 67.8 miles per hour. Consistency in running was a feature of this test as it was of the other.

### Speed on Back Stretch

On the back stretch the cars were opened out a bit, the stop watches catching the larger car at a speed of 75 miles per hour at times and the smaller one at nearly 71.4. With the stock gear ratios which these cars had the larger motor was geared to turn over at 900 r.p.m. at a road speed of 31 miles per hour and the smaller one at 900 r.p.m. at 28 miles per hour. Calculating from the average speed maintained, and neglecting slippage, which was considerable on the somewhat uneven track, the 5-48 motor turned over at an average of 2,175 r.p.m. for the hour. During its hour trial, the 3-38 engine was turning over at an average of 2,004 r.p.m.

The two cars, which accomplished the hour records, were not specially selected cars fresh from the Detroit factory. They have each had over 7,000 miles of the roughest kind of road work, having just returned from a transcontinental trip to Los Angeles and back. According to Frank H. Trego, research engineer of the Packard company, and who is responsible for the hour trials, the cars were stock in every respect, even the size of the nozzles in the carbureters being the same, whereas by the substitution of slightly larger nozzles, considerably more speed could have been obtained.

Both cars are 1915 series, but are practically the same as the corresponding models of the 1914 production. The 5-48 is the 1914 4-48 with slight refinements. The motor is a six-cylinder, the bore and stroke remaining the same,  $4\frac{1}{2}$  by  $5\frac{1}{2}$ , the engine has been cleaned up somewhat as to its external appearance by the removal of some of the external oil pipes, a screen has been fitted to the air intake horn on the carbureter and an over-running clutch to the fan. The headlights have been redesigned, but in other respects the car is the same as its predecessor.

Similar refinements appear in the 3-38, which is the successor of the 1914 2-38. The six-cylinder motor is the same as that of the 5-48 except that the bore is 4 inches instead of  $4\frac{1}{2}$ ; the stroke is the same,  $5\frac{1}{2}$  inches. Both cars were equipped with the Packard-Bijur electric lighting and cranking system, Bosch magneto, Packard carbureter, A. C. spark plugs, Hartford shock absorbers in the rear, and Goodrich Silvertown cord tires. These were 36 by  $4\frac{1}{2}$  in front and 37 by 5 in the rear. No tire trouble was encountered during the tests, and only one tire of the eight showed appreciable wear. Dunlop wire wheels were fitted to the cars.

The official weight of the cars with driver, gasoline, water and oil was 4,695 pounds for the big car and 4,727 pounds for the smaller one. McCulla, who was the driver in both runs, weighs 192 pounds.

### Cars in Full Touring Trim

Both cars were in full touring trim and in the trials, the top was down and the windshield halfway down, which was as far as it was possible to put it. The 5-48 is a seven-passenger phaeton and the 3-38 a five-passenger phaeton, though none beside the driver was carried.

Wind resistance proved to be quite a factor at these speeds as these large roomy bodies and high-backed seats presented a large surface to the air. The projected



area of the cars was about 32 square feet, and at 60 miles per hour the horsepower consumed due to wind resistance was about 96 horsepower, at 70 miles per hour the power consumed is calculated to be about 128 horsepower. This is assuming a plane surface and not crediting the car with its reduction of resistance due to deflection of the air by good body design. Probably the actual wind resistance was considerably less than that calculated.

To show the consistent running of the two cars in these trials the speed for each lap of each car is given below. The times were taken and checked by six stop watches.

LAP NO.	5-48 M.P.H.	3-38 M.P.H.
1	70.1	64.1
2	70.3	64.1
3	70.5	63.5
4	70.5	63.6
5	70.8	62.6
6	70.5	63.8
7	70.3	63.5
8	70.3	63.7
9	70.7	63.4
10	70.7	63.3
11	70.4	63.7
12	69.7	63.7
13	70.4	63.5
14	70.5	63.2
15	70.3	63.1
16	70.3	63.0
17	70.2	63.1
18	69.8	63.3
19	70.0	62.2
20	70.5	39.4
21	70.1	65.9
22	70.3	65.9
23	70.4	66.5
24	70.3	66.4
25	70.1	67.5
26	70.3	67.8
27	69.7	
28	70.5	
29	71.2	

#### MOTOR EMPLOYES IN MICHIGAN

Detroit, Mich., June 20—According to the annual report of the department of labor of the state of Michigan, covering factory statistics, for 1912, the total number of employes in 10,597 factories was 404,480 and out of this total, as nearly as the records at hand would permit, 89,413 employes were employed by concerns in the motor car industry. The number of these establishments is 578, of which 248 are in Detroit.

There were thirty-four motor car builders in Detroit in 1912, of which six have gone out of business, four have changed hands and one has become a motor car

parts manufacturing concern. In those thirty-four plants a total of 36,741 men and 859 women or all told 37,590 people were employed in 1912. The largest number was at the Ford Motor Co., 7,317; Packard was second on the list with 6,603 employes; Cadillac, third, with 4,884; Studebaker, fourth, with 3,471; Chalmers, fifth, with 2,884; E-M-F, now one of the Studebaker plants, was sixth with 2,753 men; then came the Northway Motor and Mfg. Co., Hudson, R-C-H, Hupp, Lozier, Flanders plant, now one of the Maxwell plants; Anderson, Abbott, etc.

In the state, outside of Detroit, there were then thirty-two motor car plants, of which eight are now out of business or have changed ownership. The Buick plant in Flint had the largest number of employes, 5,411. Then came the Reo concern with a total of 1,835 for its pleasure vehicle and motor truck plants, while Olds was credited with 1,033 men. All told, the records for the state plants showed 12,697 men and 530 women or a total of 13,237 employes.

In 1912, 50,827 men and women were

employed in sixty-six motor car manufacturing concerns in Michigan or nearly 57 per cent of the total number of employes in all plants connected with the motor car industry. The following statistics are interesting:

Total number of all employes connected with the motor industry in the state of Michigan in 1912.....	89,413
Total number of all employes in sixty-five motor car manufacturing plants in 1912.....	50,827
Total number of men employed in these sixty-five motor car plants in 1912.....	49,438
Total number of women employed in these sixty-five motor car plants in 1912.....	1,389
Total number of employes in thirty-four motor car plants in Detroit in 1912.....	37,590
Total number of men employed in these thirty-four plants in 1912.....	36,741
Total number of women employed in these thirty-four plants in 1912.....	859

#### COVINGTON GETS TRUCK PLANT

Cincinnati, O., June 20—Covington capitalists, with R. C. Stewart, president of the Stewart Iron Works at the head, yesterday closed a deal whereby the United States Motor Truck Co. will be transferred from this city to Covington, Ky. The amalgamation will have no bearing upon the Stewart Iron Works. The capital stock of \$250,000 has been subscribed.



A. C. A. OFFICIALS EXAMINING CAR AT END OF TEST



OFFICIALS WEIGHING THE PACKARDS AND MEASURING THEM FOR WIND RESISTANCE

# Death of Duck Decides Milwaukee Team Reliability

## Automobile Club Defeats Athletic Club for Second Time

MILWAUKEE, Wis., June 21—The cackling of geese saved Rome, but the death of an innocent duck lost the second annual reliability tour between the M. A. C. S. of Milwaukee to the Milwaukee Athletic Club on Saturday, giving the Milwaukee Automobile Club its second consecutive victory in the annual team matches between these organizations. The final score was 50 to 34, with the motor clubmen having the lesser number of points of demerit. In 1913, on June 28, the motor club won in the first annual tour by a score of 174 to 81.

Included in the novel set of rules framed by the joint contest board of the two clubs to make the second run more difficult and more interesting, was a regulation as follows:

"For each animal injured or killed on road, 50 points."

Robert Hackett, driving his Cadillac touring car, was unable to avoid a duck waddling across the road during the morning run and killed it, thus suffering the infliction of a penalty of 50 points. The motor club demerits were likewise caused by new rules, T. Harry Cochrane in an Abbott-Detroit breaking three intermediate leaves in a front spring, which at 10 points per leaf, cost the motor club 30 points. Dr. H. S. Roby in an Overland arrived 4 minutes late at one of the secret time controls and lost 4 points, a total of 34 against the motor club and the winning score.

### Distance, 120.4 Miles

The second annual tour was over a route of 120.4 miles, starting from the Athletic club in the Wells building, Milwaukee, and proceeding through Waukesha, Genesee, North Prairie, Eagle, Palmyra and Whitewater to Fort Atkinson, the noon control, 60.7 miles. The route was by no means the most direct, as the contest board decided to add several detours to test the carefulness of drivers. In one place the tourists were obliged to ford a creek containing 4 inches of water, although there was a perfectly good concrete bridge provided by the state highway commission at that point.

At Fort Atkinson the tourists were the guests of the Fort Atkinson Automobile Club and the Fort Atkinson City Club in the new \$25,000 clubhouse just completed by the latter organization. The Fort clubs tendered a fine dinner at their own expense. Following the noon meal the cars were taken to Milwaukee avenue for a series of gymkhana stunts. Frederick Gettelman, president of the motor club, won the barrel contest for most skillfully driving around a line of casks in the middle of the street. Mr. Gettelman is a well-known brewer. John I. Miller won the contest to determine which driver

was able to back 300 feet in the straightest line. Case Sanger won the hidden speedometer contest, driving 12½ miles per hour with the speed indicator covered upon instructions to drive 12 miles per hour.

### Score of the Match

The cars were checked out on the homeward journey at 2 o'clock and negotiated 59.8 miles through Jefferson, Johnson Creek, Farmington, Concord, Oconomowoc, Okauchee, Nachotah, Hartland and Pewaukee, to Milwaukee, where they were checked in at the Athletic club. Here the losing team was obliged to pay for a beefsteak dinner enjoyed by both teams. The score:

#### MILWAUKEE ATHLETIC CLUB

Car and Entrant	Road Score	Time	Penalties	Technical Penalties
Stutz, George Leiser.....	0	0	0	0
Winton, J. I. Miller.....	0	0	0	0
Cadillac, Ed. A. Farmer.....	0	0	0	0
White 60, M. C. Moore.....	0	0	0	0
Abbott-Detroit, Roy V. Rice.....	0	0	0	0
Franklin, Case Sanger.....	0	0	0	0
Cadillac, Robert Hackett.....	50	0	0	0
Hudson, Fred E. Teall.....	0	0	0	0
Buick, Arthur Aldrich.....	0	0	0	0
Hupmobile, Ed. F. Sanger.....	0	0	0	0
Stutz, John F. Dunphy.....	0	0	0	0
	50	0	0	0

#### MILWAUKEE AUTOMOBILE CLUB

Car and Entrant	Road Score	Time	Penalties	Technical Penalties
Stegeman Special, Oscar Stegeman.....	0	0	0	0
Speedwell, Herman Bauer.....	0	0	0	0
White 30, H. O. Stenzel.....	0	0	0	0
Overland, Dr. H. S. Roby.....	0	4	0	0
Mitchell, Leonard E. Meyer.....	0	0	0	0
Abbott-Detroit, T. Harry Cochrane.....	0	0	30	0
Gettelman Special, Fred Gettelman.....	0	0	0	0
Ford, M. J. Shenners.....	0	0	0	0
White steamer, John E. Sharp.....	0	0	0	0
Stevens-Duryea, Faustin Prinz.....	0	0	0	0
Lozier, R. R. Johnstone.....	0	0	0	0
	0	4	30	0

Final score:	
Milwaukee Athletic Club.....	50
Milwaukee Automobile Club.....	34

### Rules of the Contest

The run this year was based on an absolute time schedule, calling for an average speed of 18 miles per hour throughout, with tire trouble time added to the running time. Drivers were given 4 points on the morning run and 5 points on the afternoon route which they were obliged to check at a certain time. Five minutes leeway checking in or out was granted. At the finish the judges selected 1 point on each leg and checked up on the time. This was done so that no driver would know the exact point at which he would be checked and encouraged proper checking at all points. The rule resulted in the maintaining of a uniform speed throughout the run and eliminated all racing tendencies, likewise bringing the contestants into the noon and night controls in one bunch, so that dinner and supper arrangements would not be dis-

organized and the entire party kept practically intact. The day was cool and in the afternoon a thundershower caught the contestants about half-way home. Tire trouble was a negligible quantity, only three cars reporting changes because of punctures and blowouts.

The rules of the tour included the following:

For replenishing water supply in radiator at any time during run, 25 points penalty for each occurrence. There was one steam car in the contest, which was given three opportunities to replenish water and fuel supplies, once during the morning run, at noon, and once during the homeward journey.

For replenishing gasoline or lubricating oil supply at any point, during noon stop, 25 points for each occurrence.

For passing through incorporated cities or villages with muffler cut-out open, 10 points for each occurrence.

For each animal injured or killed on road, 50 points.

For springs broken on road: Master leaf, 15 points; other leaves, 10 points each.

About eight cars followed the tour as non-contestants. The number of contestants on each team was the same as in 1913, or eleven. Team captains were: Milwaukee Athletic Club, Guy F. Gregg, president; Milwaukee Automobile Club, Frederick Gettelman, president. Mr. Gregg acted as observer in Mr. Gettelman's roadster.

It is likely that the third run will be pulled off in September, as the Athletic clubmen are peeved over the loss of the second contest by the killing of a duck and want immediate revenge.

The 1913 and 1914 M. A. C. vs. M. A. C. tours form the most important reliability contests conducted in Wisconsin since the Wisconsin State Automobile Association has failed to revive the annual state tours, started in 1909. The last state tour was held in 1912.

### BANKERS STUDY FARMER-MOTORIST

Milwaukee, Wis., June 22—That the financing of motor cars for farmers has become an acute banking problem in Wisconsin is the statement made by George D. Bartlett, secretary and manager of the Wisconsin Bankers' Association. Said Mr. Bartlett:

"For the first time in the history of Wisconsin, the financing of farmers' motor cars has become an acute banking problem—so important, in fact, that it will form a principal topic of deliberation at the various group meetings of Wisconsin bankers throughout the state this year. One town of 600 inhabitants reports applications for loans aggregating \$20,000 for the express purpose of buying motor cars. The average farmer uses about \$500 cash out of a deposit for a machine and borrows \$500 on notes for the rest of the purchase price. The number of motor cars in Wisconsin has passed the 42,000 mark, which at an average of \$1,200 each, as the state records show, makes a total cost of these machines of \$50,400,000. About three-fourths of this sum is furnished by the bankers in some form or another. This gives an inkling of the importance the motor car has assumed in the expenditures of the people of Wisconsin and the demand that is made upon the bankers. The demand for machines among farmers appears to be far greater this year than ever before."



# Kline and Buick Shine in Uniontown Hill-Climb

## Fayette County Club Promotes Interesting Event

UNIONTOWN, Pa., June 20—The Automobile Club of Fayette county pulled off one of the most successful hill-climbing and racing contests ever seen in this country at Uniontown, the wealthy and beautiful center of the Pennsylvania coke region, Wednesday and Thursday.

J. D. Kerr, driving a Kline with piston displacement of 298.5 cubic inches, made the best time in the climb. This time, 3:57%, was made in the last event, a free-for-all. Second best time was made by a Buick, 318.1 cubic inches piston displacement, which made the 3 miles in 3:58%.

One of the most interesting contenders in the climb was a Metz with 196 cubic inches piston displacement, which made the ascent in 4:04½, winning second place in the last event of the contest, which was for cars of any piston displacement.

The "climb to the summit" is considered one of the worst hill-climb courses in Pennsylvania. The hill is 3 miles with a total rise of 2,007 feet in this distance. The road is built in the side of the mountain with a precipice on the right nearly all the way up. There are many bad curves, the worst being what is known as Turkey's Nest at a point one-third up. Turkey's Nest is a sharp curve to the right immediately followed by a bad curve to the left. This curve is all the more dangerous in that it is approached by a 200-yard stretch practically level and which is the only level stretch in the entire 3 miles. The steepest grade on the hill is approximately 12 per cent. Cars were given 100 yards flying start.

### Big Crowds Attend

Ideal weather helped bring out the crowds and from Pittsburgh and towns of Western Pennsylvania, motorists by the dozen drove over to the famous Turkey's Nest curve. The entries for the amateur races were confined to the members of the Automobile Club of Fayette county. A dozen or more professional drivers from other points came to participate in the professional events the second day, when cash prizes amounting to over \$5,000 were awarded.

The Hotel Titlow was the official headquarters of the American Automobile Association and George F. Titlow and Springer Todd had charge of the entries to the course. The social features of the meet were among the most pleasant happenings of the two days. Isaac W. Seamans, the millionaire coal and lumber operator of Uniontown, entertained many parties at the Summit house, and J. V. Thompson, multi-millionaire coal magnate of Uniontown and other capitalists of that place made the 2 days very enjoyable for the visitors.

There were five events each day, the

first event being a motorcycle race. On Wednesday a total of twenty-eight cars were entered in the four motor car events. These events were divided as follows: Stock cars selling at \$1,600 and under; stock cars selling at \$1,600 to \$3,000; stock cars selling at \$3,000 and over; free-for-all races for cars entered in above events.

### Thrills the First Day

The first day's races furnished a number of real thrills and many exhibitions of daredevil driving on the great S curve at the Turkey's Nest. Max Hannan had a miraculous escape from death while racing around the curve in his Buick car. Frank J. Schwarzenberger ran into the cliff at the Turkey's Nest, but regained control of his Lozier and continued on his exhibition run. John C. Shaw, manager of the Shaw Motor Co., was badly bruised when his White car was demolished in the try-out. The course was in ideal condition. The Boys' Brigade guarded the course and kept it free from travel the 2 days of the races. Two experienced surgeons, each with a full corps of nurses and aides, were stationed in the hospital tents. First day's summaries:

#### \$1,600 AND UNDER

Car and Driver	Time
Buick, W. T. Carroll.....	5:28%
Buick, H. C. Brooke.....	5:41%
Buick, Max Hannan.....	6:10%
Correja, C. H. Cramer.....	6:31%
Buick, Kerfoot W. Dally.....	6:33%

#### \$1,601 TO \$3,000

Mercer, R. C. Bigler.....	4:46
Buick, H. R. Sackett.....	5:35½
Buick, O. P. Howell.....	5:44%

#### \$3,001 AND OVER

Lozier, M. Aaron.....	5:25
-----------------------	------

#### FREE-FOR-ALL

Mercer, R. C. Bigler.....	4:41%
Buick, O. P. Powell.....	5:55%
Buick, C. E. Wooding.....	6:12%
Haynes, J. Phillip Roman.....	6:41

H. R. Sackett in a Buick started, but failed to finish.

The second day's races were fatally exciting. J. E. Shafer, driver for the Pittsburgh Mercer Automobile Co. of Pittsburgh, Pa., died in the Uniontown hospital Thursday evening as a result of an accident in the afternoon races. He was driving at a break-neck speed near the Turkey's Nest curve when his hand was seen to drop from the wheel and it was supposed that he had a fainting spell. His car ran into the stone culvert and overturned, pinning Shafer beneath the machine and causing his ribs to penetrate his lungs.

Another death on Thursday afternoon was that of Dr. Joseph Van Kirk of Elizabethtown, Pa., who suffered a stroke of apoplexy while witnessing the climbs. A number of other accidents occurred the second day. David Davies of Uniontown, Pa., was struck by a car going 50 miles an hour and his left leg was fractured; Charles W. Johnston of Uniontown, Pa., was thrown against the cliff because his front tire blew out and was badly bruised

on head and body; W. R. Scott of Waynesburg, Pa., was injured as a result of his car ramming into the side of the mountain when his tire blew out; C. M. Williams of Uniontown, Pa., was cut from falling from his car on a trial record run; Emmett Ball, Uniontown, Pa., was badly bruised in a collision; I. N. Natcher, Uniontown, Pa., was cut on face and body when run down by a racing car.

Some complaint was made by spectators of the change of signals to which were attributed some accidents. Last year, according to reports, the red flag was used to stop cars. This year the red flag was used as a starter and the yellow flag to stop the races.

A total of forty-seven entrants started in the four motor car events Thursday. The course has an average rise of over 7 per cent along the 3 miles and in many places the grade is fully double that figure. The Kline, driven by J. D. Kerr, made the summit in 3:57%, which was the speediest run of any car entered. Closely following came C. W. Johnston in his Buick, who lacked just 1 second of tying Kerr's record. The result of the second day's races are given herewith:

#### CLASS E, 600 CUBIC INCHES AND UNDER

Car and Driver	Time
Metz, John McGann.....	4:00%
Klinekar, J. D. Kerr.....	4:04
Mercer racer, W. L. Crooks.....	4:16

#### CLASS C, 301 TO 450 CUBIC INCHES

Car and Driver	Time
Buick, C. W. Johnson.....	3:58%
Buick, A. D. Spencer.....	4:23
Lozier, F. A. Close.....	4:46

#### CLASS E, 451 CUBIC INCHES OR OVER

Car and Driver	Time
Simplex, I. P. Fetterman.....	4:09
Mercedes, C. E. Siddings.....	4:48
Oldsmobile, C. M. Williams.....	4:48%

#### CLASS E, OPEN TO ANY CAR ENTERED IN

##### EVENTS 2, 3 AND 4

Car and Driver	Time
Klinekar, J. D. Kerr.....	3:57%
Metz, John McGann.....	4:04%
Simplex, I. P. Fetterman.....	4:20
Buick, A. D. Spencer.....	4:23

### FIGURES ABOUT TIRE EXPORTS

Washington, D. C., June 20—The bureau of statistics has compiled some interesting information showing the exports of motor car tires during certain periods. During the fiscal year ended June 30, 1913, these exports amounted in value to \$3,943,220. During the same period of 1912 these exports were valued at \$2,657,809, while in 1911 the value was \$2,085,107.

The exports, by grand divisions, in 1913, were as follows: Europe, \$1,977,029; North America, \$1,626,155; South America, \$100,065; Asia, \$36,212; Oceania, \$185,807; Africa, \$17,952.

Our best customer for tires in 1913 was Canada, which imported \$1,324,459 worth. England was second, with imports valued at \$1,125,718, while Belgium was third, with an import value of \$401,900. Germany holds fourth place, with imports of tires from this country valued at \$401,196.

# Society of Automobile Engineers Meeting at Cape May

## S. A. E. Mixes Professional and Social Sessions

**C**APE MAY N. J., June 24—Special telegram—The semi-annual meeting of the Society of Automobile Engineers was opened formally this afternoon by President Henry M. Leland, who aroused much interest by his comparison of the standing of the engineering profession in America and that abroad. He said in part:

"It was my privilege in 1910 to be entertained, with some of you, by the Institute of Engineers of Great Britain, with a large party of the members of the American Society of Mechanical Engineers. In the summer of 1913 I again had the privilege of going with the same society when we were entertained by the German Engineering Society in twelve of the principal cities of Germany. We were most royally entertained and the trip was from the beginning a revelation of the most interesting experiences for a mechanical engineer. One thing that impressed itself very strongly upon me was the greater and better standing which the engineers of both Germany and England seem to have with their governments and communities, as compared with the conditions in our country. The annual meeting of the German society held in Leipsic last June was called to order by the Lord Mayor, who made a very fine address. Different important members of the local government were in attendance and took part in the meeting. Members of the reichstag were present and the king of Bavaria graced the occasion with his presence, listening to the various papers and deliberations of the meeting. We were informed repeatedly that whenever the government had in contemplation any great engineering feat, or in fact any engineering problem, the authorities having the matter in charge invariably went to the officers of the engineering society and counseled with them in reference to the project and the men whom they should choose to carry out the work.

### Standing of Foreign Engineers

"In many other ways we saw unmistakable evidence of the better standing of the engineering profession in both these countries than we enjoy here in the United States. In casting about for a reason for this state of things, it occurred to me that it may be due to the fact that in both these countries all the various classifications of engineers are merged together in one great national engineering organization. I presume that each of the various organizations, such as those of the automobile engineers, the electrical engineers, the mechanical engineers, etc., have their own local divisions for conference and discussion. They are, however, all also interested in the great federation of engineers and meetings of this larger and more important organization are held periodically.

This gives far-reaching and important dignity and standing to the profession, and I hope that measures will be taken in the not distant future to have all engineering societies in the United States join in a like organization."

President Leland's address was followed by the report of Hermann F. Cuntz, the treasurer and his outline of the financial standing of the society was received with enthusiasm. This was followed by a membership report and a discussion of the proposed amendment to the constitution. A professional session was then called and reports of various divisions of the standards committee were submitted.

The meeting opened informally yesterday afternoon by a preliminary meeting of the standards committee, which is reported in full on these pages. The program for the remaining days of the meeting consists of professional sessions, at which engineering papers are presented and the committee reports submitted and acted upon. The semi-annual dinner, which this year is combined with a European trip lecture, occurs tonight. The meeting closes with a field day Friday afternoon.

### Tuesday's Session

Cape May, N. J., June 23—Special telegram—The preliminary work of the summer meeting of the Society of Automobile Engineers was concluded today at a meeting of the standards committee to consider the reports of the various divisions and get them in shape for their possible acceptance by the society.

The reports from twelve divisions were heard and of these six were accepted and the other six were referred back to their respective divisions for further consideration. The divisions whose reports came up before the secretary for action are the Ball and Roller Bearings, Broaches, Electrical Equipment, Iron and Steel, Motor Testing and Pleasure Car Wheels. Those which have reported progress and which are sent back for further consideration are the Electrical Vehicle, Lock Washers, Miscellaneous, Research, Standards, Exchange and Truck Standards.

In considering the broaches report, the necessity of caution in adopting changes which would entail an extraordinary amount of expense on the part of manufacturers was mentioned. It was pointed out that the division had considered the practice of standard makers and that the adoption of the standard broach, as suggested, would require but detail changes. The Iron and Steels division will cut the number of specified steels in two if its report meets the approval of the society. The Perfection Spring Co. objects to the S. A. E. steel standard as being a low and not a high standard.

In the electrical equipment report, the

single-wire system is favored, although this will probably be a source of warm debate at the meeting of the society, as the members of the division themselves are far from unanimous. In the ball and roller bearings report an effort is made to cut the number of bearing sizes from 287 to forty-seven. The pleasure car wheels division will cut the number of tire sizes from over fifty to eight, if the report is accepted, besides adopting a set of standard rim strength requirements.

The report of the motor-testing division, read by Herbert Chase, was concerned with the adoption of a set of standard forms for noting the data secured in commercial motor tests.

### MAXWELL DEALERS VISIT FACTORY

Detroit, Mich., June 22—About 100 Maxwell dealers, all from Indiana, were the guests of the Maxwell Motor Co. of Detroit today. They arrived at 7:30, were driven to the Tuller hotel, where accommodations had been made for them, and then to the Maxwell offices on Woodward avenue. After a visit of the Maxwell plants a tour of the city was made and at 1 o'clock the Hoosiers were entertained at luncheon at the Detroit Motor Boat Club. In the evening the visiting Maxwells were the guests of the company at a theater party. Every one of the dealers will return to his home town in a new Maxwell 25.

### BUICK MANAGERS MEET

Flint, Mich., June 20—The annual meeting of the branch managers and distributors of the Buick Motor Co. was held yesterday and today. In speaking at the meeting, General Manager C. W. Nash said: "We are trying every year to build a better car to sell at a little less money, and in 1915 we are going to give you 40,000 cars which I know you will dispose of without any too much hard work."

For the next 2 or 3 weeks the factory will be the mecca of Buick dealers, of whom about 1,000 are expected during the week.

### TO IMPROVE MICHIGAN ROAD

Indianapolis, Ind., June 22—Carl G. Fisher, father of the Lincoln highway movement, has launched a plan for the improvement of the Michigan road from Indianapolis to South Bend, where it would connect with the Lincoln highway. This would give central and southern Indiana people an outlet to the Lincoln highway.

It is proposed to have a good roads day proclaimed in each of the counties in Indiana through which the Michigan road



passes. On that day people generally would be asked to work to place the road in condition for oiling. The counties would be asked to do the oiling on the road.

#### CYCLECAR TAXICAB SERVICE

A cyclecar taxicab, which will carry two passengers besides the driver, will sell for \$600 and will charge 25 cents for the first mile and 5 cents a quarter mile thereafter, is to be built by the Twombly Taxicab Co., which has been incorporated in New York state with a total capitalization of \$500,000.

The enterprise is planned by W. Irving Twombly, New York, who is the builder of the Twombly cyclecar; he is vice-president and general manager of the new company. D. Stuart Dodge, of Phelps Dodge & Co., New York, a copper concern, is president. The two men control this company, as well as Twombly's cyclecar company.

A radical feature of the enterprise is a clause in the selling contract which provides that the cabs must be operated at not to exceed 25 cents for the first mile and 5 cents a quarter-mile thereafter. Twombly states that 1,000 already have been spoken for for operation in New York, Boston and Philadelphia and that this number will be turned out in the company's factory in Nutley, N. J., between October 1 and February 1. The first cabs will be completed within a few days. One, at least, has already been constructed by the concern.

As to the cab itself, it will have a 44-inch tread; 92-inch wheelbase; a 4-cylinder water-cooled motor, 2¾ by 4 inches; an improved landaulet body and provision for carrying, Twombly states, as much baggage as the average taxicab usually can carry.

#### TRUCK ON TRANSCONTINENTAL RUN

Grove City, Pa., June 22—Advices from the west state that the Bessemer 1-ton truck that is making a transcontinental run from New York city to Seattle has reached South Bend without mishap. The truck is being driven by A. L. Meigs of the Automobile Trail Blazing Association of Minneapolis and carries an overload of 600 pounds of paint, used to mark the trail. The truck will proceed west through the Twin cities, Fargo, Bismarck, Mandan, Livingston, Butte, Missoula and Spokane, Wash.

#### SAXON IN WYOMING

Detroit, Mich., June 22—After 18 days of travel out of New York, the Saxon Lincoln highway car was reported having reached Cheyenne, Wyo., on June 21, having covered 2,009 miles. The longest day's run since the trip started was made June 20, when the car was driven from Kimball, Neb., to Denver, Colo., a distance of 186 miles.

## President Wilson Approves Highway

### National Executive Commends Lincoln Way

WASHINGTON, D. C., June 22—Official indorsement and approval of the proposed Lincoln highway has been given by President Woodrow Wilson, who, in a letter to Henry B. Joy, president of the Lincoln Highway Association, declares the roadway to be one of great need. The indorsement of the plan by the chief executive of the nation is highly gratifying to the promoters.

The president also suggested that official Lincoln highway markers be placed in that part of the road entering Washington and passing the Lincoln memorial, now under construction here. President Wilson's letter follows:

I am sure that the whole country is interested to see to it that there should no longer exist a north or south in this absolutely united country, which we all love, and that the imaginary Mason and Dixon line should be made once and for all a thing of the past, and as a small contribution to that end I earnestly suggest that the Lincoln Highway Association should grant permission to place the official Lincoln highway markers on the macadam roadway running from Philadelphia to Washington, through the properly selected streets of the latter city to the Lincoln Memorial now under construction, and from thence along the roadway through Frederick, Md., and from Frederick to Gettysburg.

I am reliably informed that this route is now or will in the very near future, be a modern macadam roadway from Philadelphia to Gettys-



#### Obituary

THOMAS H. WHITE, a pioneer in the manufacture of sewing machines, and who, almost a half century ago made the first machine to bear his name in this city, died June 22, at his home, 8218 Euclid avenue, Cleveland. Up to a month ago, when a complication of maladies forced him to quit his desk, Mr. White was the active head of the White Sewing Machine Co., of which he was president.

Mr. White was born at Phillipston, Mass., April 26, 1836, and, after a boyhood spent on a farm, his natural bent for mechanics asserted itself. His first adventures in the field of business were in a small way, and it was not until the civil war period that he became a manufacturer.

Associating with W. L. Grout, he began making sewing machines at Orange, Mass. At the close of the war, Mr. White, with several of the men employed in the Orange factory, came to Cleveland. Here the business developed rapidly, and in 1876 the White Sewing Machine Co. was organized.

From 1894 to 1898 the company manufactured bicycles, and from this the development of the motor cars grew. Early in 1900 a separate concern, the White Co., was formed, which took over the manufacture of motor cars, Mr. White acting in an advisory capacity.

The surviving relatives are four sons, Windsor T., Rollin H., Walter C. and Clarence G. White, of Hawaii; one daughter, Mrs. Horatio Ford, and a widow, Mrs. Elizabeth White.

burg, by way of Washington. The entire expense of the road, I am informed, including officially marking the highway, will be defrayed by local interests.

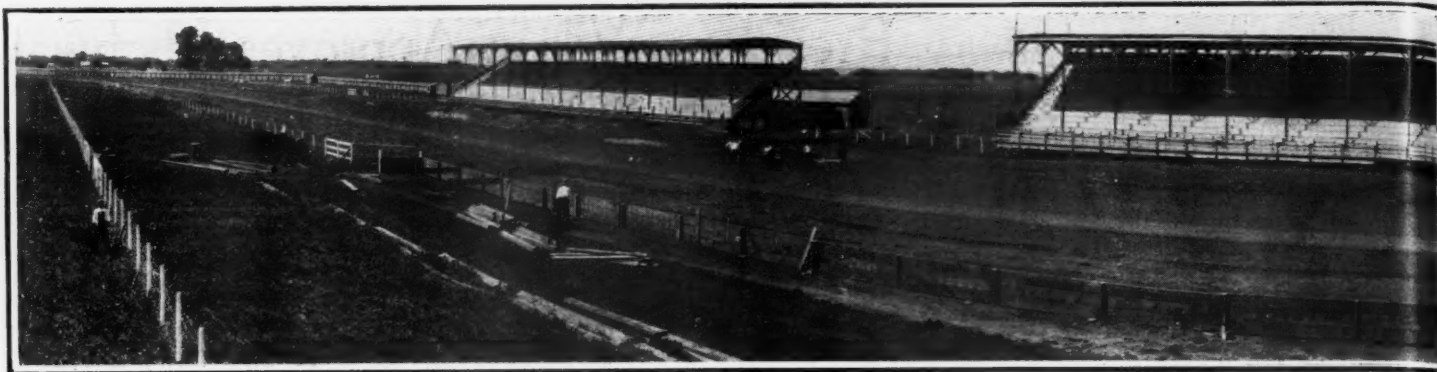
#### 1915 CAR ANNOUNCEMENTS

The L. P. C. Motor Co., Racine, has announced its 1915 line, which consists of a single six-cylinder car selling at \$1,600 in six-passenger form. This car is practically the same vehicle announced in Motor Age some time ago, and for the 1915 season will come through with chassis and body details changed but little. The motor has a bore and stroke of 3½ by 6 inches, putting it in the long-stroke class. It drives a disk clutch and selective gearset incorporated with the motor and the power is then taken by shaft to a floating rear axle with a ratio of 3¾ to 1. The Lewis has left drive and center control and comes equipped with an electric starting and lighting system.

A price reduction of \$535, from \$2,500 to \$1,965, has been made in the new series Chevrolet six. According to a statement from the factory, the car is identical with the product marketed throughout 1914 except for necessary refinements. This means that buyers can get a six-cylinder, 3½ by 5-inch motor in a 120-inch wheelbase chassis with Gray & Davis electric starting and lighting at more than a 20 per cent reduction in price. The new series Chevrolet, which was called the type C during the past season, has its cylinders cast in blocks of three and is fitted with a Stromberg carbureter and Simms magneto. The drive is through a cone clutch and three-speed selective gearset to a floating rear axle. The rear springs on this car are of the platform type. The characteristic V-shaped radiator is retained.

A neat-appearing, two-passenger roadster is announced by the Partin Mfg. Co., Chicago, the newcomer being called the Partin-Palmer 20 and sells for \$495. The motor of this new car differs from that in the six-passenger Partin-Palmer, the latter being of the valve-in-the-head construction, while the new 20 has L-head cylinders with valves in the side. Everything about the new job is standard and in no way is this a cyclecar. The engine has a bore and stroke of 2¾ by 4.

The gearset is of the three-speed selective type and is incorporated with the rear axle housing. The axle therein is of the floating type. The wheelbase is 92 inches. General body lines of the new car are very pleasing, being characterized by a long sloping hood, a graceful rear deck and clean running boards. The equipment includes Gray & Davis lighting generator, top, windshield, curtains, electric horn, tools, etc., and at an additional cost of \$75 the Gray & Davis starting system is installed.



VIEW OF THE HOMESTRETCH OF THE 2-MILE DIRT TRACK AT SIOUX CITY, IA., WHERE THE \$25,000 RACE

## Recent Events Arouse the Enthusiasm of Race Fans

### Packard's Hour Tests—National May Race Again

**C**HICAGO, June 22—In the lull preceding the racing on the Fourth of July—the 300-mile race at Sioux City, Ia., and the Tacoma meet in this country and the French grand prix—one finds plenty of racing gossip of an encouraging sort that makes it look exceedingly bright for racing in this season and next.

Undoubtedly the speed trials of the Packard on the Indianapolis speedway last Saturday and the fact that the National company has sent Johnny Aitken to France to watch the grand prix and to investigate the foreign racing motors are two things that should have a most important bearing on the racing game.

#### Packard Interested in Racing?

The fact that the Packard company has sought to discover officially just how fast its cars are is taken to mean that the company really is interested in the racing game, maybe not strong enough to support a racing team but sufficiently so that it would not discourage any racing enthusiast who might be willing to pay the Packard company its price for a car that could hold its own in fast company. Even this is a concession to the sport that the Detroit concern has not made heretofore.

#### By C. G. Sinsabaugh

No official statement to this effect has been made by the company, but the gossip at Indianapolis last Saturday was that the Packard company is realizing that there is a great interest in racing; that in consequence of this would-be supporters of the racing game are forced to buy foreign cars in order to indulge in the sport, and that the Packard company is in business to sell cars so that if the purchaser wishes to race a Packard car at his own expense possibly he might be accommodated without much effort.

It must have been an eye-opener to some of the American manufacturers to see how greedily the racing enthusiasts went after the Delages and Peugeots that ran so well in the 500-mile race at Indianapolis. Both the Peugeots brought over by Goux and Boillot were sold easily, Burman getting the Goux car for his backer, while it is said a prominent New Yorker bought Boillot's former mount for Ralph Mulford. Billy Knipper now is driving Rene Thomas' Delage for James Wilson of Rochester, N. Y. And these cars were not sold for a song, mind you.

If there is a demand for such fast cars, American manufacturers should be in a position to meet it, the critics say, and it is thought there are some makers who are beginning to feel this way also about the racing game.

Johnny Aitken's going to France is taken as a sure sign that the National company intends entering the racing game next year. While none of the officials of the National company will confirm this, still it seems to be an open secret at Indianapolis that plans have so far matured that the gossips state that Aitken and Rader are to be the National drivers. Aitken is an old standby with George Dickson, while Rader is that lanky chap who was relief driver for Stutz on Memorial day.

Another straw that shows which way the wind blows is the fact that James Wilson of Rochester, who bought the Delage, stopped at the National factory on his way to Sioux City and bought a new National racer for Knipper. In Chicago, Wilson stated he hoped to be represented at Elgin and that if he went in he might enter the National.

#### Stutz Studying Small Motor

Harry Stutz, the same gossips say, has started laying his plans for the construction of a 300-inch motor for next year's 500-mile race, while other reports are that other concerns also are giving the matter of next year's sweepstakes considerable thought.

The San Antonio Automobile Club has written the Indianapolis management suggesting that a fund of \$10,000 be raised with which to buy a trophy to be given to the American manufacturer who next wins the 500-mile race. The Texans state they will contribute liberally and that they think such a cup would be an incentive to urge American manufacturers to support racing.

Racing colors in the next Indianapolis 500-mile race, it is announced, will be uniform, according to the nation which a car represents. German machines will



BARNES IN THE EIGHT-CYLINDER ROMANO SPECIAL

The only eight-cylinder car in the American racing game is the Romano Special, which was the star of the dirt track meet at Portland, Ore., a week ago. Driven by Percy Barnes, it won all four of the races in which it started. The Romano weighs under 2,000 pounds, has a wheelbase of 110 inches, is geared 1 1/2 to 1 and the motor, a Hall-Scott aeroplane engine, is credited with 125 horsepower at 2,000 r. p. m.





WILL BE RUN ON JULY 4 AND WHICH HAS ATTRACTED MANY OF THE LEADING DRIVERS OF THE COUNTRY

thus be white; French, blue; English, green; Belgian, yellow; Italian, red, and American, red and white. Credit for the idea is due E. C. Patterson, the Chicago sportsman.

#### ALL-COLORADO DERBY PLANNED

Denver, Colo., June 18—A 270-mile consistency race for motor cars of all classes will be run July 2, 3 and 4 from Denver to Colorado Springs, Canon City, Florence and Pueblo, and return. It will be conducted under the auspices of the motor clubs of these five cities. It is aimed to make the new event an annual affair, with a different course each year. The name decided upon for the classic is the All-Colorado motor derby, and it will be open to all motorists in the state, both men and women.

A safe and sane event was decided upon rather than a race for speed, in order to avoid the necessity of barring professionals or putting them under a heavy handicap, and also to guard against danger of accident liable to result on account of sharp turns on some of the mountain grades. Silver cups will be awarded for the best score on the individual legs of the run, and there also will be a sweepstakes trophy for the best general average. The winner of any first prize for a section of the run will still be eligible for the grand prize, but will not be permitted to compete for any other point trophy.

The time decided upon as most reasonable for covering any given stretch of the course will be kept secret until the scoring point is reached by all contestants, and

then the driver coming the closest to the fixed time will be declared the winner.

#### THE NEW TACOMA SPEEDWAY

Tacoma, Wash., June 20—Located on the broad prairie 10 miles south of Tacoma, lies the new Tacoma speedway, to which is now being given the finishing touches. Practice has started for the meet which will be held July 3 and 4.

The track is exactly 2 miles in length, containing  $1\frac{1}{4}$  miles of straightaway and  $\frac{3}{4}$  mile of curves. The latter are perfectly graduated and the easements from the straightaway to the turns were figured down to the fraction of an inch. Upwards of \$30,000 has been spent to make the track particularly fast and place it in the best possible condition for fast and safe driving. Forty thousand dollars was paid

for the land by the Tacoma Carnival Association.

In constructing the track natural gravel was used as a base and scraped to the necessary height. Then thousands of gallons of water were turned on over the whole course, after which hot oil was forced in for a depth of 6 inches and after that a generous coat of asphalt was spread over the whole. The course is 30 feet wide on the straightaways and 60 feet wide on the curves.

The grandstand seats 10,000 persons and there is not an inch of the course which cannot be seen from every seat. A parking space sufficient for 216 cars has been laid out and the pits are situated directly across the track from the grandstand, giving every person a clear view of the mechanics while they are at work.



HOMESTRETCH OF NEW 2-MILE SPEEDWAY AT TACOMA, WHERE A BIG MEET WILL BE HELD ON JULY 4



BIRD'S-EYE VIEW OF 2-MILE DIRT TRACK AT SIOUX CITY, IA.



# Where to Go on the Fourth

## Hints for Holiday Tourists

**T**HE Fourth of July supremacy of the festive firecracker, the soaring skyrocket and the deadly tetanus germ—historic ingredients in the perennial celebration of the nation's birthday—will be disputed a week from Saturday when thousands of motors will hum a patriotic paean on the highways of the United States.

The Fourth of July orator will discover, too, that his eloquence no longer charms. From his bunting-festooned platform in the small town's public square or picnic grove, he will watch his former admirers roll by in motor cars of all sizes and descriptions with horns sounding disrespectful and sardonic notes. The countless eyes, which formerly followed his hand as he pointed aloft to the stars and stripes in forensic frenzy, will be fixed upon the wonders of nature, upon blue lakes, pine-clad bluffs and fields of waving wheat and corn.

The motor car has been an important factor in making the Fourth of July more safe and sane. In our patriotic zeal of 5 and 10 years ago, we burned gunpowder. Today we burn up the roads and make the holiday of all American holidays an asset instead of a liability. The bark of the car's exhaust has become more welcome to our ears than the din of explosives. We seek quiet and recreation, not noise and crowds.

For thousands of motorists, Independence day is national touring day. Coming, as it does, on Saturday this year, Fourth of July offers an opportunity for a 2-day trip, and thousands of motorists are planning to take advantage of two successive vacation days. To assist them in outlining the holiday pilgrimage, Motor Age submits a list of scenic and historic places that can be visited by the residents of several states.

### What Can be Seen by Tourists on the Fourth of July

#### ILLINOIS

**F**IRST explored by the French missionaries, Marquette and Joliet, Illinois is declared by the government surveyors to be the most level state in the union, with the exception of Louisiana and Delaware. Where level country abounds a rather monotonous aspect confronts a tourist after a run of an hour or so. However, the two leading attractions of the state are so closely together that they can be visited in this 2-day holiday.

Starved Rock and Deer park are coming into the limelight more and more as a mecca for tourists. The view from Starved Rock itself is conceded by globe-trotters to be the finest bit of landscape in the United States. It is a veritable section of Colorado scenery and the vicinity teems with historic tradition and legendary lore, as it was here we find the first point of civilization in the Mississippi valley.

The exact location of Starved Rock is between Ottawa and La Salle, or, to be more explicit, 5 miles west of Ottawa, and 90 miles from Chicago, via Aurora being the preferred routing. Nothing unusually interesting will be noticed driving

#### By Dorinda Stevens

from Chicago until within a short distance of Ottawa, when the river comes into sight, a gladsome change from the expanse of farm land passed through.

Starved Rock earned its name when the Ottawa chief, Pontiac, was killed by a Kaskaskia Indian. In seeking revenge, other tribes were brought in and a war of extermination was begun against the Illinois tribe and the decimated remnant fled to the old deserted Fort St. Louis, so named by the white explorers. Their retreat was so well protected that cutting off the supplies was the only course left to subdue them, and consequently starvation ensued.

#### Beauties of Starved Rock

Up and down the valley it is a palisaded, forest-covered bluff, with Starved Rock rising abruptly from the Illinois to a height of 150 feet. One's veins are filled with the sense of the primitive days, as no railroad or trolley dares usurp the rights of the moccasined feet on account of the ruggedness of the banks.

Nearby is Deer park, private property, but open to the public, which is noted for its remarkable canyon, the walls rising

from 75 to over 100 feet. At the eastern end there is a picturesque waterfall, close by an intensely cold natural spring, and at the north side not far from the waterfall are located two caves supposed to have been excavated by the Indians at some early date.

#### Illinois' Miniature Niagara

About 8 miles south of La Salle is to be found Bailey's Falls, the miniature Niagara, which can be so called in wet weather. In this immediate locality are also the Little Vermillion river, Spring Dell, the Pequamsoggen and Split Rock, perhaps not quite enough appreciated by the immediate residents.

Next in importance is Oregon, which the motorist can find by heading north through Princeton and Dixon. Guarding the Rock river valley, and situated in the most picturesque spot of all, Eagle's Nest bluff, is the statue of Chief Blackhawk, 75 feet in height. Just below the statue on the hillside stands the oldest living thing in the county—a gnarled cedar tree—perhaps 1,000 years old. Three-score years ago Margaret Fuller discovered an eagle nesting its young in this very tree, and thereupon named this



part of the bluffs "Eagle's Nest." At the foot of the bluff is located the Ganymede spring, and still lower is Margaret Fuller's island, a resting place that all will enjoy for the calm and quieting influence permeating the atmosphere.

Rockford is still further north on the Fox river and lays claim to several very beautiful natural parks. Many fine views are afforded from the bluffs at this town also. The return to Chicago by way of Belvidere and Elgin is made. Belvidere was once the headquarters of Big Thunder, the famous Indian chief, and it is said he is buried in a mound on the ground now occupied by the courthouse. General Allen C. Fuller of civil war fame claimed this town as his home, and as for Elgin, everyone knows where the Elgin watches and Elgin butter come from. The latest fame, however, attained by this growing town is through the running of the road races each year under the supervision of the Chicago Automobile Club.

#### Other Attractions of State

Scattered over the state like the fourwinds one finds here and there a place of some particular attraction. Alton, built upon a high limestone bluff, has very picturesque surroundings. This town is made famous by the martyrdom of Elijah P. Lovejoy, the editor and abolitionist, one of the first victims to the cause which led up to the civil war. A monument was erected to his memory overlooking the Mississippi in which his press was thrown.

With the town of Decatur, a great deal of Lincoln history is connected. The Lincoln cabin, about 8 miles to the southwest, is still kept intact and the original log courthouse in which Lincoln practiced law is to be found in Fairview park. The Lincoln homestead in Springfield is kept up by the state and a custodian is employed. The state fair grounds probably are the most extensive in the United States. Peoria is situated on the Fox river, with its residential section occupying the bluffs and its parks are among the most beautiful in the country.

### OHIO

**W**E seem to derive the name for our Buckeye state from the Iroquois, meaning beautiful river, most appropriately applied as is always the case with Indian derivatives because of the infinitely close understanding these people have with nature. The general surface of Ohio is a rolling plain, with the highest point in the western portion in Logan county, and the lowest along the shore of the Ohio near Cincinnati. The ridge which comes down from Adrian, Mich., through Bryan to Ft. Wayne formerly was the bank of Lake Erie. The largest inlets, Sandusky and Maumee bays, embrace a number of islands most interesting during our summer season. Johnson's island nearby was used as a place of confinement for Con-

federate soldiers taken prisoners during the civil war. Toledo, on Maumee bay, we find had the early name of Miami of the Lakes, which in time gave way to Lady of the Lakes, and was a noted fishing resort of Miami Indians long before the whites settled there.

Along the river drive are located Fort Meigs, Fort Miami and Turkey Foot Rock. These places were sites of battlefields and played very prominent part in the early development of this section. In taking a run south towards Maumee 9 miles the site of Fort Miami is passed, the first settlement in the Maumee valley, and still further south is Turkey Foot Rock, where Mad Anthony Wayne with only 900 men defeated 2,000 Indians led by Chief Turkey Foot.

There are no large lakes in Ohio, but in many parts there are groups of small ones noted for their beauty. Myers Lake park, 3 miles northwest of Canton, is one of the largest summer resorts in the state.

The last Indian warfare in Ohio was the battle of Fallen Timbers, Anthony Wayne forced the Indians to conclude a treaty at Greenville, relinquishing large tracts of land. It was not until after this battle that the then early settlements of Marietta, Cincinnati, Gallipolis, Manchester, Dayton, Chillicothe, Cleveland, Steubenville and Zanesville could make any progress whatsoever. The first vessel of any size and carrying capacity was the brig St. Clair, 110 tons, built in Marietta. It sailed with provisions down the Ohio, Mississippi, across the Gulf of Mexico and finally landed at Philadelphia. The first steamboat to navigate the Ohio was launched at Pittsburgh and plied between Cincinnati and Louisville.

#### Historic Old Chillicothe

Chillicothe, with all the historic memories of early years clustered about it; Zanesville and Cincinnati vied with each other as state capitals, but none of them won out.

In this connection just 3 miles north of Xenia on the way to Springfield is Old Town. This formerly was old Chillicothe, and was the scene of some of the most thrilling incidents of the early Indian warfare days. Here it was that Daniel Boone was taken by the Indians and adopted as one of them.

The location of Zanesville is particularly attractive, being on the National highway. Cincinnati seems to have been the center of the "Mound Builders'" efforts and remnants and traces of this prehistoric race still abound in the neighborhood. Miamisburg, between Cincinnati and Dayton, has one of the largest Indian mounds in existence just outside the city.

Again we find traces of the mound builders near Hillsboro, 54 miles from Cincinnati. The Great Serpent is 1,450 feet long and lies on the top of a high bluff overlooking the Brushcreek valley. There is but one other of the kind in the world and that is in Asia. About 13 miles

east of Hillsboro, Paintcreek affords a wild picturesque view, with its deep gorge and numerous caves. Steubenville was the scene of the final days of Morgan's raid, he being captured close to the northern boundary, making it the high-water mark of the civil war.

In Dayton is to be found Newcomb's tavern, which once was a famous trading post. This old house still stands in its original furnishings, including the sun dial in a little park surrounding it. Hills and Dales is a privately owned park of 1,200 acres and is worthy of an investigation with its miles and miles of winding well-kept roads, and many rustic camps equipped with all kinds of kitchen utensils for the use of picnickers.

As in Iowa, there existed an "underground railroad" for runaway slaves. The first station was in Ripley. Hudson also was an abolition stronghold. Mormonism flourished in Ohio previous to its migration through Iowa. For several years in Kirtland it seemed imbedded for life, but finally under condemnation of public opinion, John Smith and his followers fled from the state. Conneaut, in the extreme northeastern corner in the state, is supposed to have been the birthplace of the Mormon bible.

We can refer to Ohio as the birthplace and home of many of our famous and well-known men. Mansfield was the birthplace of General Sherman; Niles of President McKinley, and Canton for many years his home; Thomas Edison was born in Milan.

Akron is well known to the motor car world as the center of the rubber industry, and its growth due to this industry has been phenomenal. This was the home of John Brown for a number of years and the house in which he lived still stands. Portage Path, the trail used by the Indians in making their portage from the Cuyahoga to the Tuscarawas on trips between the Great Lakes and the Ohio river runs through the western edge of the city.

### IOWA

**T**O the tourist, no matter how well versed in the touring possibilities of the various states, Iowa means a network of good roads. We were introduced to the King drag first used on Iowa roads and since then the vigorous campaign for improved highways has kept up. East and west, more familiarly known are the River-to-River road; the official Iowa trancontinental, later a section of the coast-to-coast Lincoln highway; the White Pole road, the Blue Grass trail, the Hawkeye highway and north and south there is the Capitol-to-Capitol highway, the Inter-State trail, and many others.

As Iowa is known as the Hawkeye state, then again we have the name repeated in one of the important cross-state highways, it is interesting to learn the name is said to have been taken from an Indian chief who was the terror to travelers in the Mississippi region. No

state surpasses this in the quality and extent of cultivated land. The northern part of the state has a continuation of the many small, clear, pebbly lakes of Minnesota in glacier-scored pits; some of them—the Walled lakes—are surrounded each by a natural wall of loose stones. The largest of these are Spirit lake, the two Okoboji lakes and Clear lake, all popular summering spots. In the town of Spirit Lake is a good collection of curios installed by the commercial club and although privately owned is on view to the public. Lake Okoboji is of interest to all travelers. On the shore stands the log cabin where the Spirit Lake massacre occurred in 1857. Many pretty drives take the motorist around this lake region. West Okoboji is of great depth, and lies between wooded hills indented by several picturesque promontories. Clear lake is 10 miles west of Mason City on the North Iowa pike. It was here the Indian war, known as the "Grindstone war," took place.

The first settlement of the state was in Dubuque, named in honor of Julien Dubuque, a French trader, who with other settlers were attracted there by the lead abounding in that region. It is located partly on a terrace, which is occupied by the business section compactly built and on bluffs rising 200 feet high in which portion the streets rise picturesquely one above the other.

#### Davenport an Interesting Place

Pleasantly situated at the foot of the Upper Rapids we find Davenport, one of the tri-cities, on the slope of a steep bluff which extends for 3 miles along the river and commands an extensive view. Colonel Davenport's original home is still preserved on Rock Island, the 900-acre park maintained by the government and situated in the middle of the river. Here it is claimed the government maintains the largest arsenal and ordnance manufacturing plant in the United States, employing over 2,500 men. The roads on the island are fine boulevards. The largest and best collection of Indian relics in the United States is to be found in the Academy of Natural Science in Davenport.

A roadway extends on south to Burlington, known in the earlier days as "Flint Hills" from its location on the limestone bluffs. Of more than ordinary attraction is Crapo park at the south limit of the city. A statue of General Corse, who wig-wagged the signal "Hold the fort, for I am coming" during the campaign before Atlanta, stands in this park. A drive along the bluffs allow the motorist to survey the river and magnificent bottom lands from several points of vantage. These bottom lands are levied and drained, as distinguished from the western lands, which are irrigated.

In making the 42-mile run to Keokuk a stop can be made just north of Ft. Madison, whence can be seen the Mississippi

river, dotted with beautiful wooded islands, while in the distance on the Illinois shore stands the historic town of Nauvoo, the former Mormon stronghold, at one time the home of Brigham Young, Joseph Smith and others, celebrated in the history of Mormonism.

#### Power Dam at Keokuk

Within the last 3 years, Keokuk has developed into the power city of the Mississippi valley, due to the 27,000,000 horsepower dam across the river at this point ranked second to the Panama canal in point of engineering skill. Power is furnished to St. Louis, 150 miles distant, for public utilities, and has affected such a change in the river for 60 miles north that an immense lake has formed, affording an ideal place for water sports and summer amusements. Keokuk derives its name from the Indian chief of that name, and a bronze monument overlooking the Mississippi has but recently been dedicated to this warrior.

In traveling back north to the Lincoln highway we find Iowa City, first selected as the state capitol. The old capitol building now is used as the administration building by the university. To the east of Iowa City by 20-odd miles on the River-to-River road we discover the site of a German communistic religious colony, a domain of 26,000 acres held as common property. It includes the seven villages of Amana, East, Middle, High, West and South and Homestead, all of European style of architecture. The society is of German origin founded in the eighteenth century, and by its members is known as the "Community of True Inspiration." Family life is kept up, but in every village are from four to sixteen "kitchen-houses" where meals are prepared and served. Various enterprises are owned and operated by the combine.

How many have heard that oft-repeated saying, "Go west, young man, go west!" It was Horace Greeley who sent J. B. Grinnell off with this famous injunction, and he located in the city which bears his name. During the troubled days before the civil war, Grinnell was a hotbed of abolition feeling, and one of the stations on the famous "underground railroad" which passed runaway slaves onward in their search for freedom. Still further west but 24 miles from Des Moines is situated the Carlsbad of America, Colfax. This is by reason of its widely-known mineral waters, discovered by prospectors for coal. The town is built around the hillside like a natural amphitheater and from the northside of the hill many fine views are afforded.

Just 22 miles east of Marshalltown, in the county of Tama, we find an Indian reservation of 419 acres, occupied by the remnants of the Sacs and Foxes. Marshalltown is known to have housed the Mormons nearly a whole winter on their trip westward, and the spot, located close to the city, is called Mormon Ridge.

Again we find the Mormons in Council Bluffs, as they were violently ejected from this place before they became the pioneers of the settlement in Utah. Council Bluffs is said to have derived its name from a council held between the Indians and the explorers Lewis and Clark. Long after this council the government made this location the headquarters of the Pottawatamie Indians and they staid until the Mormons arrived. These people built a large number of cabins and called the place Kanessville, but 5 years later started their overland trip to Utah. The city nestles among the bluffs with stretches of residence streets running back into the picturesque hills, across the valleys toward the river, a distance of 4 miles. Lake Manawa, a summering point, is easily accessible from Council Bluffs, and is but 3 miles distant.

#### NEW YORK

NEW YORK state with its Adirondacks, its Catskill and Alleghany mountains, its Hudson, its Niagara, and two of the great lakes and the St. Lawrence marking the northern limits, not to forget Long Island at the doorway of New York city, offers to the motorist and the pleasure-seeker wonderful vistas of beauty and grandeur.

The picturesque beauty of the Hudson and the historic interest clustering along its banks has given this stately river the nomenclature of the Rhine of America. It was in 1609 that Henry Hudson, a Dutch navigator, sailed up this river to a distance of 150 miles, and on his return to Europe the Dutch East India Co. was advised of the results. Whereupon Dutch trading establishments were formed, the earliest of which was Fort Orange, founded in 1613, on the site of Albany; New Amsterdam, now New York city, was formed a few years later. The aspect of the countryside still manifests its old Knickerbocker origin, and this brings to mind old Rip Van Winkle, a legendary character of the Hudson valley, who slept for 20 years in the peaceful haunts of the old Dutch settlers, according to the book written by Washington Irving.

#### Glories of Lake Champlain

Pre-eminently, today, the Adirondacks and its glorious Lakes Champlain and George, is the mecca of tourists. Lake Champlain, lying between the Adirondacks of New York and the Green mountains of Vermont, was discovered in 1609 by Samuel Champlain, governor of Canada, and is closely associated with the early history of New York and our struggle for independence. This lake is 110 miles long and on either side are lake and mountain resorts, from the little hamlet to the fashionable modern hotel. Plattsburg, on the western shore of the lake, was the scene of a land and naval battle in 1814, and today offers many features for those seeking entertainment and diversion. Nearby, under the shadow of Mt. Whitefriars, and easily reached from





*Duster time is here. With the coming of calorific July, the motorist discards his coat of tweed or homespun and dons a lighter garment of linen. In the illustration are shown three 1914 model dusters, any one of which should prove most serviceable on the holiday tour. The coat on the left is a single-breasted duster of Irish crash mixture cut on balmacaan lines. It has a full back, kimono sleeves finished with cuffs, Prussian collar and side slash pocket. It sells for \$10. In the center is shown a double-breasted duster of natural linen. It has a set in sleeve with tab cuff, loose belted back, side slash and pleated breast pockets and a roll lapel collar that can be buttoned up about the neck when the weather is inclement. It also is listed at \$10. The third coat shown is marked \$7.50. It is a single-breasted duster of Irish linen with straight back, Prussian collar, raglan shoulders and loose sleeves finished with cuffs. All three coats are from The Hub, Chicago.*

the Lake Champlain resorts, is Lake Placid, its wonderful mountain and lake scenery having earned for it the title of "The Switzerland of America." John Brown's grave is near this lake.

Further south we come to Ausable chasm with its wonderful rock formations. The "pot-holes," geologists say, are relics of the glacial period.

Nor must we overlook the Vermont side of Lake Champlain which offers to the motorist just as wonderful mountain scenery, just as delightful spots in the river valleys as we find on the New York side.

#### Interesting Fort Ticonderoga

Going down the river from Lake Champlain to Lake George we find Ticonderoga and 2 miles east on the lake is the old Fort Ticonderoga and Crown Point which was taken by Ethan Allen and his Green mountain boys in 1775. And then Lake George, with its crystal clear water, hemmed in by mountains. A trip on either side of the lake will give the motorist wonderful vistas of the glories of the lake and the surpassing beauty of the mountains. A trip by boat, if one has the

time, should not be overlooked, for here stretch visions of beauty from one end of the lake down its entire length.

#### The Catskill Mountains

South of the Adirondacks is the Catskill mountains, covering an area of 500 miles. The name is derived from the streams whose valleys were formerly infested by wildcats. The scenery is particularly rugged and picturesque, and offers varied attractions to suit all tastes. Slide mountain rises to a height of 4,205 feet. Kingston, the gateway to the Catskills, was settled by the Dutch and Huguenots and is made memorable by the framing of the first constitution of the United States in 1777. The old senate house, built in 1676, still stands.

In the central part of the state is a chain of lakes, known as the Finger lake region, all named after tribes which once dwelt on their shores, Canandaigua, Seneca, Cayuga, Onondaga, Oneida, etc. Adding to the beauty of the lakes are the foothills of the Alleghanies which assume quite mountainous proportions. There are resorts aplenty throughout this locality and no one need lack for diversion and recrea-

tion, for the lakes offer their particular attractions, for they are all beautiful and all are different, and rest and quiet may be found in the hills. Here we find the hillsides covered with vineyards, for this is the large grape and vine-producing section of the state.

Then, too, there are Lakes Erie and Ontario separating the state from our Canadian neighbors on the north, together with great Niagara with its stupendous cataract, and the scenic beauty of the St. Lawrence, each offering its quota of attractions to those who are seeking rest and recreation.

#### Long Island Good Touring Place

Before leaving the state, we must not forget Long Island, which offers the cave dwellers of New York city a breathing spot that is not only scenic but has much in a historical way to interest. Here may be found the level seacoast on the south with its broad expanse of ocean, which is in sharp contrast to the hilly north side overlooking the sound. Flushing, an old historical town, contains the old Quaker meeting house of 1694. At Roslyn, the home of William Cullen Bryant, is one

of the sight-seeing places, and his grave may be seen in the old village burying-ground.

### TEXAS

**T**EXAS, the Lone Star state, the largest state in the union, the cotton-growing state, the rice-producing state, the cattle-raising state, was originally a part of the Spanish province of Mexico and was under Spanish rule for more than a century. It was during this period that the quaint old Spanish missions, now historical sight-seeing points of San Antonio and vicinity, were founded, the best-known being the Alamo, which was so desperately defended in the war of 1812 by 183 Texans against several thousand Mexicans, in which the defenders were all killed. Another mission, built about the same time in 1718, is the San Jose. Other missions scattered in and around the city bespeak of the early Spanish life before the independence of Texas was won.

San Antonio itself is a quaint and picturesque Spanish city, on the San Antonio river 150 miles from the gulf coast. Many of the quaint characteristics of the old Spanish regime are still in evidence in the public plazas, and the narrow streets in the old part are still called by their Spanish names. Three miles from the center of the city are the hot sulphur wells. Good roads radiate in all directions from the city.

#### Attractions at Galveston

Going down to the coast and crossing the \$2,000,000 causeway, 2½ miles in length, is Galveston, the second port in the United States in value of foreign exports, and the greatest cotton port in the world. The city, founded in 1839, stretches 7½ miles westward and is 1½ miles wide, and is protected now from the sea by a wall 17 feet high. Galveston has many attractions with its more than fifty public buildings, beautiful monuments, drinking fountains for both men and beast, Fort Crockett military reservation, its shell roads and oleander parks. Here too is the magnificent Galveston beach course.

Corpus Christi, easily reached from Galveston and San Antonio, with its shell beach, offers to the motorist an attraction in the way of surf bathing.

Houston, named after General Sam Houston, is reached from Galveston over a 50-mile shell road. It is principally a manufacturing center.

Austin, the capital, has the largest university in the south, and is the birthplace of Postmaster-General A. S. Burleson. About 200 miles north and west is Dallas, the center of the cotton industry, where the motorist can see the cotton grown and prepared for exportation.

### WISCONSIN

**A** BOAT and a motor car are equally essentials of a tour of the "play-ground of the middle west." The Dells of Wisconsin at Kilbourn afford many

hours of exploration and one's fanciful imagination can picture most anything out of the water and wind-corroded rocks and declivities. Such appropriate names as Lone Rock, Hawk's Bill, Chimney Rock, Ladies' Slipper, Giant's Hand Visor Ledge, Witch's Window and a couple of dozen others induce lazy observation and a desire to find a more fitting nomenclature—but it is a hopeless task.

A place where beauty and perfect rest abound is at Ephraim, situated at the extremity of the narrow peninsula stretching northward between Green bay and Lake Michigan. Many an attractive drive lures the motorist in this locality and a day or so could profitably be spent here.

#### Home of the Millionaires

Lake Geneva and Delevan lake are favorites with many. An oiled macadam road encircles Lake Geneva and carries the motorist past splendid estates of Chicago millionaires.

Milwaukee, the Cream City, for many years was called the "German Athens of America," acquired through its almost exclusive population of Germans. Many fine drives are to be enjoyed in and about Milwaukee, notably that to Whitefish bay, 3 miles distant.

Four Indian reservations are found in Wisconsin, the Stockbridge being entirely self-supporting through its lumber-cutting rights, the Menominees and Chippewas deriving most of their support from a like source. Nearly 8,000 Indians are in the state either as citizens or tribal relations and this is as large a number as at any period in its history. Many legends are connected with points throughout the state. For instance, Spirit lake in the St. Louis river opposite Superior contains in its center Spirit island, where a young Sioux chief eloped with his sweetheart of a rival tribe, defying the "family quarrel." Here they disappeared completely and no Indian has been known to tread its shores, and even the civilized Chippewas of today regard the spot with superstition. Many Indian legends are connected with points in the vicinity of Green Bay. Weird happenings in the old fort buildings are recorded in history. Connected with the Blackhawk war there are numerous legends, but dates and authentic data are much in dispute.

In Prairie du Chien the first pontoon used in crossing the Mississippi to McGregor, Ia., was hung. This city also was the home of Zachary Taylor during the civil war, and from his home that Jefferson Davis eloped with Zachary Taylor's daughter.

### CALIFORNIA

**T**HE romantic El Camino Real, with its ruins of the old Franciscan missions, the beauty of the Yosemite, and the majesty of the Sierras, all beckon to the Californian and the wayfarer, to lay aside the cares of business and home and enjoy the wonderful gifts of Nature which

she has bestowed so lavishly upon the state that lies between the desert and the sea.

For California has innumerable trips in many directions for its motorists, so whether one be in the land of the missions with their romantic past, or on the shores of the ocean, or in the mountains and their valleys, trips full of interest and beauty can be found from ½-day to several days' duration. Boulevard highways are everywhere and extend from end to end of the state, while Nature's handiwork lends an ever varying charm.

California, the Golden state, was discovered by the Spanish in 1542, when Cabrillo landed at San Diego. Today, this city, with its wonderful environments, offers much to the motorist in the way of trips and entertainment. Passing on to Pasadena, Santa Barbara and Los Angeles we find great opportunities for passing a delightful holiday. Each has its beautiful drives, winding through deep canyons and mountain gorges, its palms, its orange groves. An hour's drive from Los Angeles brings one to the ocean.

San Francisco is the central and objective point through which the Yosemite, Lake Tahoe, the big trees, etc., are reached, while shorter trips can be made to San Jose, Bakersfield, Fresno, Del Monte, and many other equally as attractive points.

In the northern part of the state Mt. Shasta and the redwood forests vie with the beauties and warmth of the balmy south.

### MICHIGAN

**T**HE hub of the motor car industry is credited to Michigan, for around Detroit centers the greatest motor car manufacturing section in the world. A very fine boulevard system has been laid out in Detroit, including picturesque Belle Isle in which a section has been kept in as natural a state of trees and shrubbery arrangement as possible. Many fine 1-day trips are available out of Detroit, going into Canada for some, as the entrance port, Windsor, is just across the river.

#### Michigan's Summer Resorts

Michigan is well supplied with summering points. Surrounded on three sides by water, one finds the lakes lined with the usual vacation desires and every city can be reached by motor car. One can skirt the shore of Lake Michigan up to Traverse City, Petoskey, Mackinac—and one can even continue around the north end of Lake Michigan into Wisconsin if he longs for pioneer excitement; south along Lake Huron through Alpena, Bay City, to Port Huron on Lake Huron and the St. Clair river, through Mt. Clemens to Detroit and along Lake Erie to Toledo, O.

One finds few inland lakes of any size, but in and around Pontiac there are a number of small ones where many summer cottages are built. Walled lake and Orchard lake, perhaps, are the most beautiful



of the many in this vicinity. The motor car road winds around the east shore of the lake, swinging a little to the left on the bluffs overlooking the water.

Mt. Clemens is a good choice for a bath. Accidentally it was found that the water from the salt wells possessed medicinal properties and sanitoriums sprung up to accommodate the many visitors. About thirty different chemical ingredients constitute the makeup of the water.

#### Haven for Hay Fever Sufferers

In the strait between Lakes Huron and Michigan stands a limestone rock about 7 miles in circumference, rising to an altitude of nearly 300 feet in its center, called Mackinaw. The Indians, impressed by its forms, called it Michilimackinac, meaning the Great Turtle, which now is the retreat for hay fever sufferers. Not far from Sault Ste. Marie on the shore of Lake Superior are the pictured rocks of which it is the popular belief that it is the work of human hands. They resemble old castles, temples, arches and other objects when viewed from a short distance and are the effects of the water wearing away the sandstone rocks.

Grand Rapids is best known through its numerous manufacturing interests devoted to furniture. Manistee is the chief salt-producing center of the west, and 5 miles from the city is located the Nellie Whitney fruit farm of 375 acres, which, in conjunction with Buckley & Douglas' orchard

2 miles further north, containing 475 acres and over 26,000 trees, are largest up-to-date orchards in the state.

#### PENNSYLVANIA

TO the city-weary motorist, Pennsylvania, the Keystone state, comes in for its share of attractions. The name Keystone was given to the state because of its central location among the original thirteen states at the time of the framing of the constitution. It is rich in revolutionary history and its Gettysburg is a monument of our own civil war. It is also a great oil-producing state and its oil products are known to be among the best. Then, there are the coal fields, with its Pittsburgh, which have their peculiar attractions.

Delaware gap, which is easily reached from Easton, Reading, Scranton, Wilkes-Barre, Harrisburg, Philadelphia and New York and the intermediate cities, is one of the most picturesque spots in the state and is formed by the Delaware river breaking through the Kittatinny range. The gap is walled on either side by mountains 1,600 feet high. On the road to Scranton is Mt. Pocono, the summit of which is easily accessible by motor. There are a number of summer hotels here. Bear Creek, 45 miles from the gap, is the rendezvous of many of the coal barons of Wilkes-Barre and Scranton. Port Jervis, N. Y., a drive of 40 miles from the gap, is another picturesque route. DeWitt

Clinton, father of the Erie canal, was born at Fort DeWitt, 8 miles from Port Jervis, and William S. Bennett, founder of the Chicago Tribune, was born in a log house on the Clove road.

The southern part of the state is filled with landmarks of the war of 1863 and all through this section it is not only scenic but it is thronging with memories of the wartime days which should appeal to every true American. Gettysburg and vicinity is accessible to our Maryland motorists, as well as to all Pennsylvanians. The battlefield covers 25 square miles and has been laid out into fine avenues of macadam.

Bedford Springs, on the eastern slope of the Alleghenies, is easily reached from Pittsburgh, Altoona, Harrisburg, Gettysburg and Hagerstown and Cumberland, Md. Here all the summer attractions and recreations are to be found.

#### Historic Spots in Pennsylvania

At Erie, Pa., is Presque Isle bay, where Perry's fleet was built in 1813 and started for the battle of Lake Erie. Here, too, the Indian conspiracy of Pontiac in 1763 was mapped out. Denman Thompson, famous in "Old Homestead" and other dramas; Horace Greeley, and many others of renown were born in the vicinity of Erie, and their old homes still can be seen. From a manufacturing standpoint Erie is known as having the largest engine and boiler works in the world.

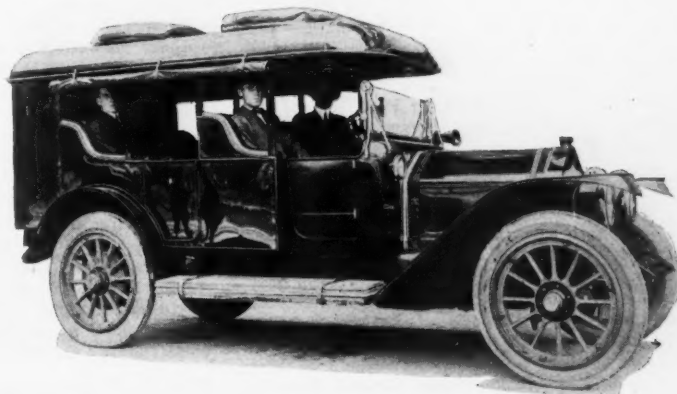
## Sleeping Accommodations for Those Who Go on Tours

### Two Ideas of Value to Motorists Making Long Trips

THERE is nothing like motoring across the country in luxury. At least that is the opinion of H. M. Butts of Denver who has had built a special body on his National chassis, which not only affords comfortable seats for five persons, but sleeping accommodations as well.

Mr. Butts is an enthusiastic motorist

and during the greater part of the summer months, leads his family, consisting of his wife and three children, into his motor car, leaves



NATIONAL FITTED FOR LONG-DISTANCE TOURING



BAGGAGE SPACE IN THE REAR; EXTRA BED UNDER AWNING ON SIDE

dull care behind and travels in search of scenery and pleasure.

Last year he motored from Denver to California and return in the same car, but instead of the present novel body, it was of the roadster type. While on the trip he conceived the idea which he

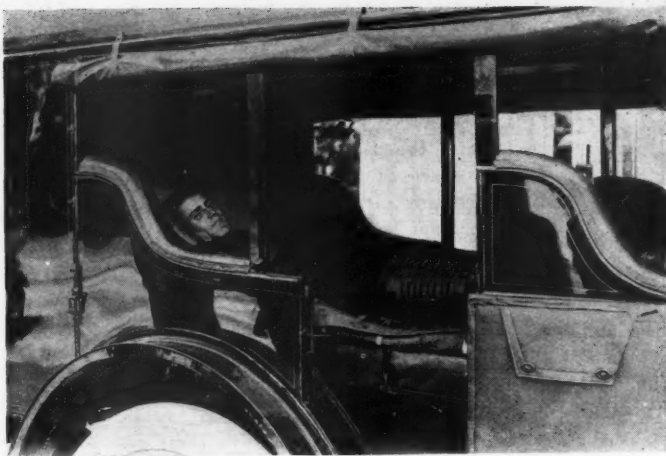
had carried out during the winter and which is a motor car "a la Pullman sleeper." This year, while traveling across the deserts, if night overtakes him while many miles from any town, all that he will have to do will be to make down his berth and go to bed. The front and back seats of the car as well as the back cushions of both seats, can be let down inside the car, making a bed 6 feet long and 4 feet wide. A narrow canvas sheet then can be stretched along the side of both sides of the car on a level with the top of the

doors, making room for two more persons. The side beds are covered with water-proof canvas which will keep off the rain.

On the rear of the car has been built a special cabinet in which can be carried clothes on clothes hangers, suitcases, tools and other small baggage. The top, or covering of the car is stationary and cannot be let down as can the ordinary tops. On tops of the roof will be carried the extra tires and inner tubes in especially built cases. A small electric light placed in the roof of the car will light the entire interior at night.

Over the rear seats Mr. Butts provided another cabinet for toilet articles and above it is a larger compartment for hats, even of the much feathered class. Along the sides of the car there has been built a series of large pockets, one especially for thermos bottles and the rest for various small articles. The special body was built by a Denver concern.

A Fort Casey, Wash., Ford owner has devised a novel scheme for converting his car into a sleeping apartment for an entire family of six children, including two adults and four children. This is accom-



AS THE BERTH IS MADE UP IN BUTTS' CAR

plished by using a sort of collapsible mattress which folds up when not in use so that it can be carried on the running board. The mattress is spread out to rest on the tops of the seats, extending the width of the car, when the top is raised, and reaching from the top of the rear seat to a point below the steering wheel, with sufficient space remaining to permit the occupants to undress, preparatory to retiring, in front of the car. A corner is cut out of the lower end of the mattress so that it will fit around the

steering wheel. By doing this the contrivance is held firmly so that it can slide toward the windshield when under the weight of the occupants. The uprights supporting the top keep the mattress from shifting too far to either side. Blankets are spread on the mattress to make it soft and comfortable.

The mattress is made of heavy canvas. Strips of spruce  $1\frac{1}{2}$  inch thick by  $1\frac{1}{2}$  inch wide are tacked between two layers of the cloth at intervals of about 1 inch or more. By following this method the mattress may be rolled up into a roll of about 6 inches in diameter. During

the day, if desired, the mattress may be used as an awning. For this purpose two extra strips should be carried to act as awning supporters or uprights.

Berths are arranged for the children in the lower part of the car by removing the cushions and placing them with blankets on the floor of the car to a level with the back seat. In this space three small children may have sleeping quarters. It is possible also to fit up sleeping quarters for a small child in the front seat space of the little car.

## Answers to Route Inquiries from Motor Age Readers

### San Angelo, Tex.—Fort Smith, Ark.

**S**AN ANGELO, Tex.—Editor Motor Age—Kindly furnish me with a routing from San Angelo, Tex., to Fort Smith, Ark., by the way of Oklahoma City, Okla.—L. C. Stephens.

You should go first to Sweetwater, then turn east toward Fort Worth, passing through Escoto, Trent, Abilene, Hamby, Lazarus Ranch, Albany, Breckenridge, Caddo, Palo Pinto, Mineral Wells, Weatherford to Fort Worth, 219 miles. You have an option of two routes to Oklahoma City: one via Dallas thence north through Denison; or, from Fort Worth via Bowie, Lawton and El Reno.

The Dallas-Denison route is as follows: Fort Worth east through Arlington and Grand Prairie to Dallas, 33 miles; thence north through Plano, McKinney, Anna, Howe, Sherman, Denison, Durant, Milburn, Mill Creek, Sulphur, Davis, Wynnewood, Lexington, Noble, Norman, Moore to Oklahoma City, 280 miles.

The optional route via Lawton and El Reno from Fort Worth is through Newark, Decatur, Wichita Falls, 122 miles; thence through Burkburnett, Randlett, Emerson, Lawton, 60 miles; and Steecker, Anadarko, Virden, Chickasha, Minco, El Reno, Yukon to Oklahoma City, 146 miles, or a total distance from Fort Worth of 328 miles.

In routing to Fort Smith, Ark., from Oklahoma City you will go through Shawnee, Bearden, Okemah, Okmulgee, Morris, Muskogee; from Muskogee you have the choice of two routes, one through Summit and Checotah to Warner, or through Keefeton to Warner. It might be well, before leaving Muskogee, to inquire as to the better route. After leaving Warner the balance of the trip is through Webbers Falls, Salisaw, Hanson to Fort Smith.

### Napoleon, O.—Petosky, Mich.

Napoleon, O.—Editor Motor Age—Kindly give me the best route from Napoleon, O., to

Petoskey, Mich., also the approximate distance.—H. M. Overmyer.

Leaving Napoleon, go via Wauseon, Lyons, Seward, Adrian, Tecumseh, Tipton, Brooklyn, Napoleon, Jackson, Leslie, Mason and Holt to Lansing, 121 miles. Leaving Lansing route through DeWitt, St. Johns, Bridgeville, Ithaca, Alma, Foresthill, Mt. Pleasant, Weldman, Barryton, Evart, Avondale, Lucas, Cadillac, 146 miles.

It is a day's run, or 123 miles from Cadillac to Petoskey, unless you wish to make a leisurely trip of it and enjoy the beautiful scenic views of northern Michigan. From Cadillac go via Manton, Sherman and Wexford, to Traverse City, 53 miles; continuing north through Acme, Elk Rapids, Milton Center, Torch Lake, Eastport, Norwood, Charlevoix, Bay Shore Station, Petoskey, 70 miles. Blue Book, Vol. 4, covers this entire trip with complete running directions.

### Waterloo, Ia.—Grand Forks, N. D.

Waterloo, Ia.—Editor Motor Age—Kindly map out a route from Waterloo, Ia., to Grand Forks, N. D., via Minneapolis.—T. F. McDonnell.

Going to Minneapolis, 210 miles, route through Janesville, Waverly, Plainfield, Nashua, Charles City, Osage, St. Ansgar, Austin, Blooming Prairie, Owatonna, Medford, Dundas, Northfield, Farmington, Rosemont, St. Paul, Minneapolis. To Alexandria, 142 miles, you should pass through Osseo, Elk River, Clear Lake, St. Cloud, Avon, Freeport, Sauk Center, Psakis, Alexandria.

You will have a good macadam road to Anoka; an occasional stretch of sand will be encountered on the balance of this stretch.

Alexandria-Fargo stretch, 123 miles, is via Evansville, Ashby, Dalton, Fergus Falls, Rothsay, Barnesville, Fargo; thence 95 miles through

Mapleton, Hillsboro, Reynolds and Merrifield to Grand Forks.

### Memphis, Tenn.—Collingwood, Ont.

Memphis, Tenn.—Editor Motor Age—I contemplate making a motor car trip to Collingwood, Ont., and would like some general information in the way of best and shortest route, road conditions, and the non-resident regulations in the various states and Canada.—R. J. Gallang.

The best road to Nashville is Collierville, Rossville, Moscow, Saulsbury, Essary Springs, Corinth, Iuka, Tusculum, Florence, Lawrenceburg, Crestview, Ridley, Columbia, and Brentwood. To reach Louisville motor through Gallatin, Scottsville, Lucas, Glasgow, Cave City, Bear Wallow, Buffalo, New Haven, Bardstown, Mt. Washington and Ashville. From Cave City Mammoth Cave can be reached, and from Buffalo the Lincoln Farm can be visited.

It is 136 miles to Cincinnati on good stone or gravel roads through St. Mathews, Middletown, Shelbyville, Newcastle, Carrollton, Oberdeen, Rising Sun, Aurora, Lawrenceburg, Homestead, and Cleves. A day's run of 204 miles to Toledo is that through Avondale, Sharon, Mason, Lebanon, Dayton, Harshman, Springfield, Urbana, Bellefontaine, Kenton, Dunkirk, Findlay, Bowling Green, Perrysburg, Maumee and Toledo. Although not the best road, the shortest to Detroit is 58 miles and leads through Monroe, New Port, Trenton, Sibley, and Wyandotte.

Crossing into Canada routing to Hamilton through London is via Windsor, Old Castle, Ruthven, Leamington, Wheatley, Cedar Springs, Blenheim, Ridgetown, Highgate, Glachau, Wardsville, Melbourne, Delaware, Lambeth, London, Crumlin, Thamesford, Ingersoll, Woodstock, Cathcart, Burford, Brantford, Cainsville, Alberton, and Ancaster. Toronto is 47 miles



distant and the road leads through Aldershot, Freeman, Trafalgar, and Lambton Mills.

From Memphis to Toronto you can have running directions by purchasing Blue Books, 3, 4, and 1. Each volume is \$2.50, and gives optional routes if those outlined above are not to your satisfaction.

From Toronto to Collingwood journey through Aurora, Bradford, Barrie, and Stayner.

#### Texarkana, Tex.—Kokomo, Ind.

DeKalb, Tex.—Editor Motor Age—Please publish a route from Texarkana to Kokomo, Ind., with condition of the roads.—L. F. Lindsay.

To have the best roads, you should route to Dallas, via Clarksville, Detroit, Blossom, Paris, Brookston, Bonham, Whitewright, Anna, McKinney, Richardson and Padgett. Turn north and at Denison, 85 miles, reached through McKinney, Melissa, Anna, Van Alstyne, Howe, and Sherman. From Durant through Oklahoma the itinerary is Milburn, Mill Creek, Davis, Wynnewood, Lexington, Noble, Moore, Oklahoma City, Edmond, Guthrie, Mulhall, Perry, Ponca City, Newkirk to Arkansas City, Kan.

With 234 miles to Kansas City over good dragged road you route via Winfield, Douglas, Augusta, Haverhill, Eldorado, Burns, Florence, Clements, Cottonwood Falls, Emporia, Waverly, Williamsburg, Ottawa, Edgerton, Olathe, and Martin City.

Crossing Missouri the regular routing is followed, being through Independence, Blue Springs, Oak Grove, Odessa, Higginsville, Blackburn, Mt. Leonard, Marshall, Slater, Glasgow, Armstrong, Yates, Higbee, Renick, Clarke, Mexico, Martinsburg, Wellsville, Montgomery, New Florence, High Hill, Jonesburg, Warren, Wright City, Wentzville, and St. Charles.

Over the National highway through Illinois and on to Indianapolis takes you 173 miles to Terre Haute through Collinsville, Highland, Greenville, Mulberry, Hagerstown, Vandalla, St. Elmo, Effingham, Montrose, Greenup, Casey, Martinsville and Marshall. On to Indianapolis the towns are Brazil, Harmony, Reelsville, Coatsville, Belleville, Plainfield, and Bridgeport. Go north 52 miles to Kokomo over good gravel road through Carmel and Westfield.

#### Farmington, Ill.—Grand Rapids, Wis

Farmington, Ill.—Editor Motor Age—I would like the best route from Farmington, Ill., to Grand Rapids, Wis., and give the distance.—E. E. Davis.

From Farmington go to Peoria, 23 miles, through Trivoli and Hanna. Leaving Peoria, go 150 miles to Rockford, Ill., the towns en route being: Peoria, Chillicothe, Henry, Bureau, Princeton, Kasbeer, Dixon, Oregon, and Byron to Rockford.

Madison, Wis., is your next objective point, 76 miles. Leaving Rockford, the route follows closely the course of the Rock river into Beloit, thence through Janesville, Edgerton, Stoughton, McFarland to Madison. It is 73 miles to Fond du Lac through Sun Prairie, Beaver Dam and Waupun; thence 62 miles to Amherst via Dale, Fremont, Weyauwaga, and Waupaca. From Amherst pass through Plover to Grand Rapids.

#### Valentine, Neb.—Hot Springs, S. D.

Valentine, Neb.—Editor Motor Age—Kindly give me the best route from Valentine, Neb., to Hot Springs, S. D.—Harold P. Yeast.

From Valentine go through Cody, Merriman, Gordon, Clinton, Rushville, Hay Springs, Bordeaux, Chadron, Whitney, Crawford, Harrison, Van Tassell, Node to Lusk, Wyo. You now have 98 miles to travel to reach your destination and before leaving Lusk make sure that you have plenty of gas and water, as the first part of the road winds across uninhabited prairie; you will have no trouble in following the road. Leaving Lusk go through Hat Creek, Edgemont, and Minnekaota to Hot Springs.

#### Boston, Mass.—Buffalo, N. Y.

Brookline, Mass.—Editor Motor Age—Kindly give me the best route from Boston, Mass., to Buffalo, N. Y. I will ship the car to Detroit, then I want to tour from there to Davenport.

Ia. Kindly give me the mileage.—F. K. Mougey.

Boston to Springfield is a routing through Auburndale, Wayland, Marlboro, Northboro, Shrewsbury, Worcester, Leicester, Spencer, Brookfield, Warren, Palmer, and N. Wilbraham. Springfield to Albany is Westfield, Woronoco, Huntington, Chester, Lee, Lenox, Pittsfield, Shaker Village, New Lebanon, Nassau, Scho-dack Center and Rensselaer. Albany west through New York is via Schenectady, Amsterdam, Fonda, Palatine Bridge, St. Johnsville, Little Falls, Herkimer, Mohawk, Frankfort, Utica, Vernon, Oneida Castle, Chittenango, Mycenae, Manlius Center, Syracuse, Camillus, Elbridge, Sennett, Auburn, Seneca Falls, Geneva, Canandaigua, Mendon, Pittsfield, Rochester, and 76 miles into Buffalo, going through Scottsville, Mumford, Caledonia, Le Roy, Batavia, and Williamsville.

Boston to Albany is 188 miles; Albany to Buffalo, 318.

Detroit to South Bend is a routing of 208 miles, traveling through Dearborn, Wayne, Ypsilanti, Ann Arbor, Chelsea, Jackson, Albion, Marshall, Battle Creek, Kalamazoo, Paw Paw, Dowagiac, Summerville, and Niles. It is not necessary to come into Chicago unless you wish to do so, for you can route through New Carlisle, Laporte, Valparaiso, Dyer, Joliet, Morris, Ottawa, LaSalle, Princeton, Wyand, Sheffield, Anawan, Atkinson, Moline and Davenport. Should you wish to take in Chicago you can leave the above route at Dyer, go north through Hammond and South Chicago to Chicago, then to Ottawa through Forest Park, Hinsdale, Naperville, Aurora, Plano, Sandwich and Somonauk.

South Bend to Ottawa is 153 miles direct, but via Chicago 219 miles; Ottawa to Davenport is 102 miles.

#### Hudson, Wyo.—Cheyenne, Wyo.

Hudson, Wyo.—Editor Motor Age—Kindly give a route from Hudson, Wyo., to Cheyenne, Wyo.; Central City, Neb.; Lincoln, Neb.; Sioux City, Ia.; Alton, Ia.; Fonda, Ia., and Cedar Rapids, Ia.—L. V. Denwan.

Leaving Hudson, Wyo., go through Arapahoe and Riverton to Shoshoni; thence in an easterly direction through Moneta, Wolton, Mokoma, Natron, and Cadoma to Casper, Wyo. To Douglas, Wyo., it is 52 miles through Glenrock, Inez Station, and Fetterman. Leaving Douglas, you have 149 miles to go to reach Cheyenne, the way points being Orin Junction, Glendo, Wheatland, and Chugwater.

Your next objective point, Central City, Ia., is 415 miles distant. Leaving Cheyenne motor through Bushnell, Potter, Sydney, and Chappell, to Julesburg, Neb., 143 miles; thence through Ogallala and Sutherland to North Platte, 85 miles; via inland, Gothenburg, Lexington, Kearney, Shelton, Wood River, Grand Island, and Chapman to Central City, Neb., 187 miles.

To reach Lincoln, Neb., retrace your route to Grand Island, 23 miles, then go east 100 miles through Hampton, Waco, Tamora and Emerald to Lincoln, Neb.

From Lincoln, Neb., route through Waverly, Louisville, and Millard to Omaha, 64 miles; thence via Calhoun, Blair, Tekamah, Oakland, Walthill, Homer and Dakota City to Sioux City, Ia., 112 miles.

Leaving Sioux City route through Hinton and Merrill to Le Mars, 26 miles, thence to Alton, Ia. To reach Fonda, Ia., return to Le Mars and go east 82 miles via Remsen Station, Cherokee, Alta, Storm Lake, and Newell to Fonda, Ia.

Cedar Rapids, Ia., is 211 miles. Leaving Fonda motor through Manson to Fort Dodge, thence via Webster City, Wilkie, Alden, Iowa Falls, Parkersburg, Cedar Falls to Waterloo; then south through La Porte City, Vinton and Newhall to Cedar Rapids.

At Fort Dodge you have an optional route to Cedar Rapids, which is south from Fort Dodge 40 miles through Roberts Station and Dayton to Ogden, where you strike the Iowa transcontinental route, thence east 142 miles through

Jordan, Nevada, Colo, State Center, Marshalltown, Montour, Chelsea and Belle Plaine to Cedar Rapids.

Vol. 5 of the Blue Book gives complete running directions, also optional routes covering the entire distance from Wolton, Wyo.

#### Pharr, Tex.—Galesburg, Ill.

Pharr, Tex.—Editor Motor Age—Kindly give me a route to Galesburg, Ill.—J. F. McCune.

To reach San Antonio your route lies through McAllen, Raymondville, Ricardo, Kingsville, Alice, Skidmore, Beeville, Pettus, Kenedy, Karnes City, Falls City, Floresville, and Calaveras.

A distance of 331 miles lies between San Antonio and Ft. Worth by way of Selma, Solms, New Braunfels, Gruene, San Marcos, Austin, Georgetown, Granger, Bartlett, Temple, Pendleton, McGregor, Waco, China Springs, Valley Mills, Clifton, Meridian, Walnut Springs, Glen Rose, Rainbow, Nemo, and Cleburne.

Before entering Oklahoma the towns of Newark, Decatur, Alvord, Sunset, Bowle, Bellvue, Henrietta, Wichita Falls, are passed through, being 123 miles, then the Red river is crossed at Burkburnett, and the run through Oklahoma made via Randlett, Lawton, Anadarko, Chickasha, Minco, El Reno, Kingfisher, Hennessey, Waukomis, Enid, Jefferson, and Caldwell, Kans. Wellington and Peck to Wichita. Continuing north on the Meridian road through Newton to McPherson 65 miles, turn east for Kansas City, 224 miles, and travel through Hillsboro, Marion, Lost Spring, Herington, Delavan, Council Grove, Allen, Admire, Miller, Rapp, Osage City, Burlingame, Scranton, Overbrook, Baldwin, Edgerton, Olathe, Pleasant View, Lenexa, Overland, and Shawnee.

On the Inter-State trail into Iowa the road lies through Smithville, Edgerton, Dearborn, Halleck, St. Joseph, Union Star, King City, Ford City, Albany, New Hampton, Bethany, Eagleville, Lamoni, Leon, to Osceola. Turning east here on the Blue Grass the balance of the journey lies through Woodburn, Lucas, Chariton, Russell, Melrose, Albia, Blakesburg, Ottumwa, Batavia, Fairfield, Lockridge, Rome, Mt. Pleasant, Middletown, Burlington, and to Galesburg, 50 miles, through Oquawka, and Monmouth.

Running directions of the trip from San Antonio to Galesburg, can be found in the Vol. 5 Blue Book.

#### Corrects Route Information

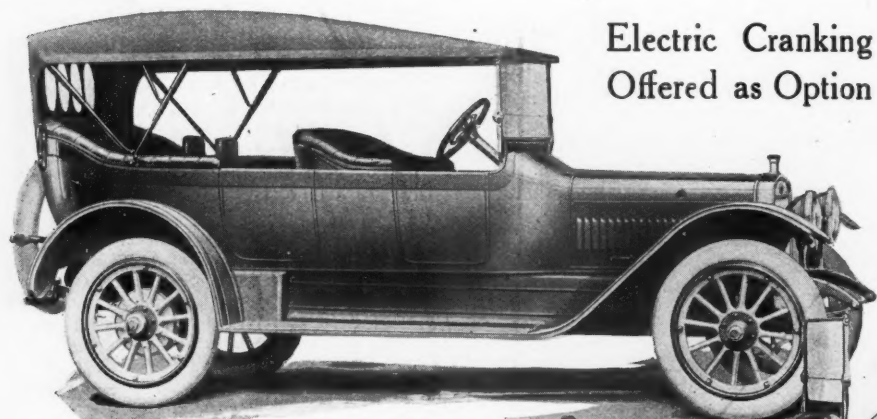
Fort Worth, Tex.—Editor Motor Age—It has been called to my attention that on page 43 of the May 28 issue Motor Age tells W. A. Dunn, Victoria, Texas, that the proper route from Victoria to Wahpeton, N. D., is via San Antonio to Waco, "where you strike the Meridian road, over which you can continue to your journey's end through Dallas, Denison, Oklahoma City, Arkansas City," and so on. I notice also that the Blue Book is referred to for running directions over this road.

For the information of tourists I wish to say that the Meridian road from Waco runs through Fort Worth, Texas, thence to Wichita Falls, over the Red river at Burkburnett, thence to Lawton, Okla., and El Reno, and that reference to the 1914 Blue Book, Vol. 5, routes Nos. 736-737 and 739, will show that these sections are listed as the Meridian road.

The road referred to from Dallas to Oklahoma City is shown in the Blue Book, Vol. 5, Routes Nos. 747 and 748, as a section of the Oklahoma, Texas and Gulf highway.

The Meridian road should not be confused with any short-line highway. On account of the immense amount of work that has been done on the Meridian road under that name, we feel that where tourists are advised to follow the Meridian road the route should be given to them correctly, so that they may pass through the towns and cities that have made the Meridian road possible.—W. H. Beck, secretary, Meridian Road Association of Texas.

# Wintons for 1915 Have New Design of Body



NEW SIX-PASSENGER WINTON

**D**ETAILS of the 1915 Winton six, known as model 21, have been made public and indicate that while the car has seen very little change mechanically, improved appearance has been obtained by complete re-designing of the body. Besides this, electric cranking has been made optional with the purchaser, the Winton air system of turning the crankshaft, which method was used exclusively heretofore, being fitted instead if desired.

The body retains its streamline effect, while a new beauty has been given it by the continuous lengthwise raised panel which outlines the upper edge of the body all around. The cowl has been sloped so as to meet the hood, and thus body and bonnet are blended into a smooth-line unit. Greater roominess in the front seat is obtained by this new body design.

The radiator has been made 2 inches higher and  $2\frac{1}{2}$  inches wider, which, of course, means a larger bonnet. This is in good proportion to the body size and gives a pleasing appearance to the whole.

## Little Change Mechanically

There has been no appreciable change in the engine and its allied units. It has a horsepower of 48.6, according to the S. A. E. formula. The cylinders, which are  $4\frac{1}{2}$  by  $5\frac{1}{2}$  in size, are cast in pairs with their valves on the right. The same peculiar intake manifold construction is employed, whereby the carbureter is placed on the left side and the two-branch manifold running from it passes over the tops of the cylinders to the valve side, where these branches in turn run into a horizontal pipe, with an opening into each cylinder block. One change in equipment is the use of the Rayfield carbureter instead of the make used last season.

Winton still uses the vertically split aluminum crankcase, which divides into right and left halves, to provide for the ready removal of the crankshaft or other working parts. The main crankshaft bearings are in the right half, allowing the other side to be taken off without disturbing them. In the left half there are three

## Electric Cranking Offered as Option

made of nickel-steel; the camshaft and cams are a one-piece forging, the profile of the cams being such as to give a flow of gas proportionate to piston speed. This shaft is removable through the front of the case without dismantling any of the rest of the valve mechanism. The valves themselves are 2 inches in diameter and interchangeable. The timing gears at the front are of drop-forged steel, spirally cut as a noise reducing medium.

The Winton system of lubrication still is unchanged. Circulation of the oil is by



WINTON MODEL 21 IN FOUR-PASSENGER FORM

## FEATURES OF 1915 WINTONS

*Body redesigned, giving better lines and more room*

*Radiator is larger*

*Electric cranking offered as an option*

*Six-cylinder L-head motor,  $4\frac{1}{2}$  by  $5\frac{1}{2}$*

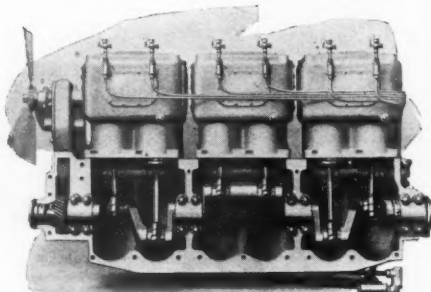
*Rayfield carbureter adopted*

*Wheelbases, 130 and 136 inches*  
*Roadster and four-passenger,*  
*\$3,250*

*Six- and seven-passenger, \$3,500*  
*One-man top, and Dann oil-cushion inserts stock equipment*

5 by 8-inch hand holes, which allow complete inspection.

The moving parts are all of careful design and balanced so as to reduce vibration to the minimum. The piston rings, connecting rods and wrist pins of any one set are all of the same weight to give this balance; the crankshaft, which is carried on four Parsons white-brass bearings is



WINTON MOTOR SHOWING BEARING SURFACE

two pumps, operated by an eccentric on the rear end of the crankshaft. One pump takes oil from the reservoir and delivers it through tubes to the crankshaft main bearings and the timing gears, from which points it runs into the crankcase. The other pump draws oil through strainers from the crankcase and returns it to the tank, where it again is strained before use. The oil tank is at the right of the engine. The cylinders, cams and camshaft bearings get their lubrication by the splash of the connecting rods, while grooves in the pistons distribute it around the surfaces. To prevent a smoky exhaust due to excessive oil, the flow of the lubricant is regulated by a by-pass in proportion to the motor speed.

## Magneto Is Optional

Ignition is by either a Mea or a Bosch dual magneto, with a storage battery to supply auxiliary starting current. The plugs still are placed horizontally in the cylinders over the intake valves so that they are swept by the fresh incoming mixture. The plugs are  $\frac{7}{8}$ -inch standard. The magneto is placed on the right side of the engine at about mid-distance back and strapped down on an integral crankcase bracket. It is driven off the end of the shaft, which takes care of the centrifugal water pump drive and the silent chain drive to the air pump. This driving assembly is shown in one of the illustrations.

Due to the increased size of the radiator, even greater cooling surface is presented by it, the increase over last season's being about 14 per cent. The fan is driven by gearing, which is enclosed at



the front end of the engine. This drive has an adjustable spring-tension clutch, which is said to secure proper air suction without possibility of accident to the fan or its adjacent parts. The fan is now surrounded by a shield, which directs the air to the cylinders, and is a safety feature. This shield was not used last season.

As already mentioned, the well-known Winton air-anking system may be had, or the engine will be equipped with an electric cranking apparatus. In the air system there is a pipe connection to each cylinder head and the pressure from a tank is sent to the cylinders to force the pistons down. This pressure is maintained by a Kellogg air pump.

The electrical system to be used has not definitely been decided upon, several makes being tested out at this time. With the air system, a Gray & Davis generator is used for furnishing current for lights. A Willard storage battery also is employed. It is probable that the same make of generator as the motor used for cranking will be installed when this part of the apparatus is decided upon. Nothing definite can be said at this time with reference to the electrical equipment for lighting and cranking, however.

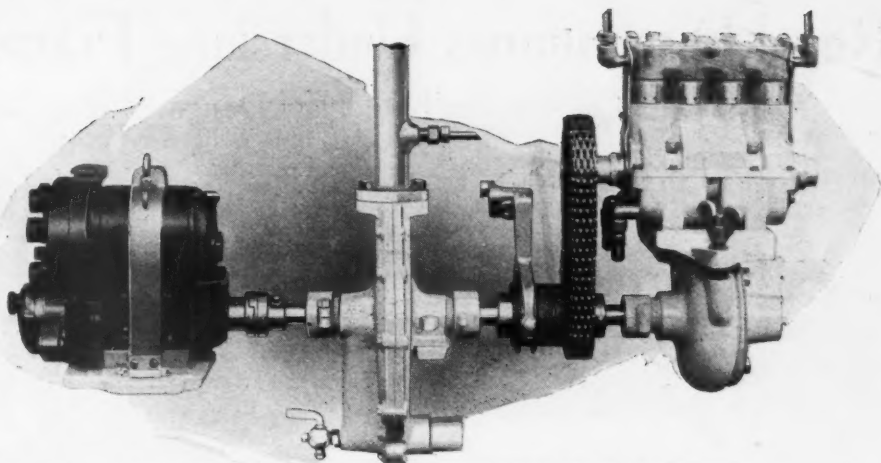
#### Winton Chassis Details

The Winton model 21 uses the same type of multiple-disk clutch as its predecessor. There are sixty-three high-carbon steel disks, thirty-one of which are attached to the transmission shaft and thirty-two to spiders driven from the flywheel. The unit runs on F. & S. annular ball bearings, while four springs held in pockets and spaced equidistant around the clutch distribute the disk tension equally. Because the disks operate in oil, there is no jerky action, the oil films having a cushioning effect. The clutch unit is housed in the forward end of the gearcase and is readily accessible through a hand hole.

The gearset, which is not in unit with the engine, affords four forward speeds, with direct on third. The shifting is selective, the gears sliding. Interlocking arrangements make it possible to enter neutral when the clutch is engaged, but impossible to get any other gear combinations. The gears have wide faces, and are constructed of a special alloy steel.



FAN OPERATES IN RADIATOR SHIELD



HOW MAGNETO, WATER PUMP AND TIRE PUMP ARE DRIVEN

There is no change in either the drive shaft back of the gearbox or in the rear axle. The shaft is fitted with a cross-type universal at the forward end and has a roller-type universal at the rear. The axle is floating and made with a large factor of safety. The differential unit is readily removable, as are the shafts and bearings. Gears are of nickel steel and Timken bearings are used throughout the rear member. Conventional internal and external brakes operating on the usual form of drums are employed. A torsion rod parallels the drive shaft to take the drive.

In the transmission of the power back from the engine there is interposed between the motor and clutch a universal joint similar to that at the rear end of the drive shaft. This is enclosed in a grease-tight metal case, removal of half of which allows the dismantling of the gearbox, so far as the front end is concerned. At the same time it takes care of any possible misalignment between gearset and crankshaft.

#### Spring Suspension Improved

The springs are three-quarter elliptic in the rear and made long so as to give low suspension. More leaves have been added this year, as they are thinner. This makes for greater resiliency. The rear springs take the place of radius rods, having no front end shackles and being suspended outside the frame. The diameter of the shackle bolts has been increased and a new form of rebound strap supplied. A new feature of the Winton spring construction is the incorporation of the Dann lubrication cushion inserts between the leaves. These inserts have pockets of congealed lubricant and keep the springs in good shape at all times. They are standard equipment. The spring sizes are: rear, 46½ by 2 inches; front, 52 by 2¼ inches.

Tires all around are 37 by 5 inches, which is an increase over last season, in that 36 by 4½-inch tires were then used. The wheels are of twelve-spoke wood type.

Steering is on the left and control in the center, which is well-nigh standard in America now. Spark and throttle levers are on the wheel, which is 18 inches in diameter. A new form of spark and throt-

tle ball joint is now used on the control rods in that they have springs to take up backlash.

The wheelbase is 130 inches on the run-about and four-passenger cars, while the larger types have this dimension increased by 6 inches. Some body dimensions of the five-passenger car are: extreme width, 70 inches; distance from dash to seat, 26 inches; height of driver's seat from floor, 16 inches; width of front doors, 22 inches; width of rear doors, 24 inches; distance front to rear seat, 33 inches.

All the doors have been widened and are carried on concealed hinges. Handles do not extend through them. Cars having auxiliary seats are provided with inclosed compartments, where the seats may be stored when not required. The cowl board fixtures have been rearranged to give a symmetrical appearance and ultra convenience to the driver, while a tonneau light is also a new kink that will be appreciated.

Equipment is complete and includes one-man top, a new design of rain-vision glass front, Waltham 8-day clock, tire carriers of a new type at the rear, tire pump, Klaxon horn under the bonnet. Prices are unchanged. The roadster and four-passenger are \$3,250; the six and seven-passenger, \$3,500.

The clearance is 9¾ inches. Three optional gear ratios are offered: 3.928 to 1; 3.69 to 1, and 3.428 to 1. The following shows the speed of the car in miles per hour at 1,000 r.p.m. of the engine:

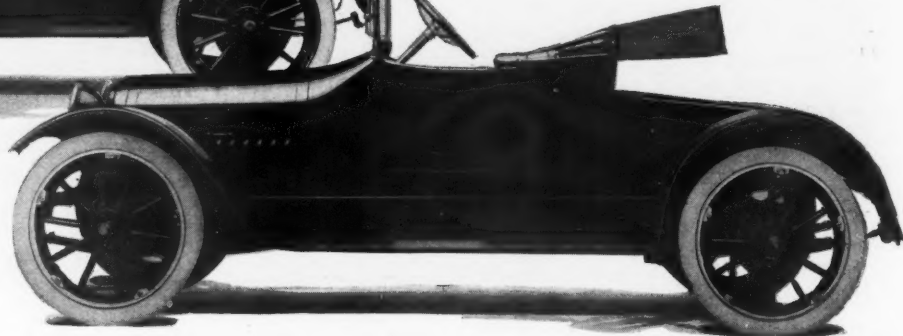
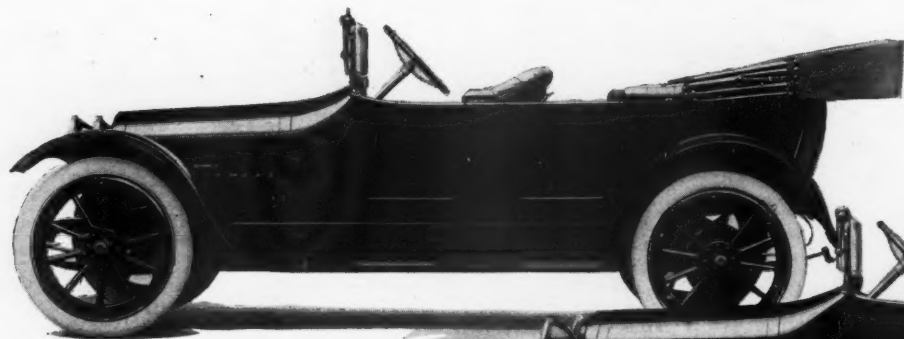
BEVEL GEARS ON DRIVESHAFT AND REAR AXLE			
TRANSMISSION	3.928	3.69	3.428
First speed	9.00	9.59	10.32
Second speed	19.42	20.67	22.23
Third speed	28.02	29.82	32.09
Fourth speed	35.28	37.52	40.36

#### DETROIT'S EXPORT TRADE GOOD

Detroit, Mich., June 22—The total value of all the goods exported through the port of Detroit in May, 1914, was \$4,732,456 and 22 per cent of this total, or \$1,077,884, represents the motor car export business. As the total value of the motor cars exported in May, 1913, was \$862,535, this year's total shows an increase of \$215,349, or 20 per cent.

# Regal Discontinues Underslung Frame and Lowers Price

Car Practically of New Design—Filler Cap under Hood



having the water outlet to the radiator from the waterjacket as a part of it. This part shows nothing out of the conventional for detachable-head constructions. The pistons are provided with three ring-grooves and below the lower one, several holes are drilled in a chamfered cut which has the effect of catching any oil getting

**R**EGAL motor car representation for 1915 is centered in a single chassis model, which supersedes models T and C of last season. It is practically a new design throughout, although still adhering to several features which are characteristic of Regal construction.

The new type, which is designated as model D when fitted with touring body and as model R with roadster dress, marks the passing of the underslung construction from the Regal shops, for it has the conventional type of suspension with frame over axles, as had the model C cars last year.

## Body Lines Improved

The 1915 Regal is up-to-the-minute in appearance and construction, and reflects a great deal of study and forethought on the part of the Regal organization. The touring car, with a well-designed five-passenger body, sloping cowl and hood, domed fenders and wide doors, is a classy proposition, and should make history for the company the coming year.

Considerable reduction in price has been made, either the touring car or the roadster being obtainable for \$1,085 with complete appointments. Last season's prices were \$1,125 for the underslung model and \$1,350 for the overhung type.

The wheelbase of the new Regal has been made 112 inches, which is a compromise between the two lengths offered last year. That is, model T was a 108-inch car, while model C was 116 inches. The present length gives ample space for a very roomy body.

Regal engineers have accomplished much in the new power plant. With a bore of  $3\frac{3}{4}$  inches, which is the same as that of last season's underslung car, and a stroke of 5 inches, which is 1 inch greater than the stroke of this same engine, the new motor weighs exactly 151 pounds less. This weight reduction has been accomplished in a number of ways. Better balance with lighter reciprocating parts is one factor, while quite material saving of weight is obtained by the use of a stamped lower crankcase instead of the former cast-iron type.

The old engine had a rated horsepower

THE UPPER ILLUSTRATION SHOWS THE NEW OVERHUNG REGAL FIVE-PASSENGER TOURING CAR AND LOWER ILLUSTRATION THE SAME CHASSIS WITH A ROADSTER BODY

## FEATURES OF THE 1915 REGAL

*Long graceful body curves are pleasing*

*Touring car or roadster at \$1,085*

*Motor stroke 5 inches instead of 4*

*Develops 39.4 horsepower against 22.5 for old motor*

*Atwater Kent ignition adopted*

*Radiator filler cap under the hood*

*Floating instead of semi-floating axle*

of about 22.5, but this new one has turned up 39.4 horsepower at 1,960 revolutions a minute in test. This was with a 1-inch carbureter, whereas the cars for the market are equipped with a  $1\frac{1}{4}$ -inch size, which is conducive to still greater power output.

## Details of the Motor

The motor is suspended at three points from the main frame, and is of the block-cast type with detachable cylinder head. The valves are on the left side in conventional L-head form and the manifolds are of the simplest. Distribution of the gas to the cylinders is effected within the casting itself, a single opening to the carbureter intake pipe being found. The exhaust header is an integral part of the casting also and runs horizontally along the upper left side of the block to the rear, where it makes a right-angled turn, joining the exhaust pipe in vertical position.

The cylinder head which is securely held down by fourteen bolts, carries the spark plugs and pet cocks in addition to

this far up in the cylinders, and allowing it to escape back to the crankcase, preventing its going out through the exhaust in the form of smoke.

## Unusual Piston Rings

Piston rings are of unusual construction. There are really three shallow rings to each piston groove, making a total of nine in three sets per piston. These are made of  $\frac{1}{8}$ -inch cold-rolled steel. In constructing them a strip of steel of this thickness is first spirally wound, then pressed together and cut to make the rings. These pieces are next ground to proper size.

The use of this type of ring is said to prevent gas escaping once the motor is worn in.

The camshaft runs on three bearings which are of phosphor bronze. It is driven from the front end by spiral timing gears completely housed. Due to the fact that there is no magneto, ignition being taken care of by an Atwater-Kent system, there are only two main gears at the front of the engine. The spiral gearing for driving the vertical ignition distributor shaft is mounted on the end of the camshaft and housed with it. The generator, which is mounted at the opposite front side, is not gear driven, but is actuated by the same belt that drives the fan. This will be taken up in detail later in connection with the electrical system. Such elimination of parts—there is no outside shaft for driving any units—is another factor aiding weight reduction.

The lubrication system is a force feed and splash type. A plunger oil pump operated by the camshaft forces oil through one pipe to the rear main bearing and the rear camshaft bearing, and through

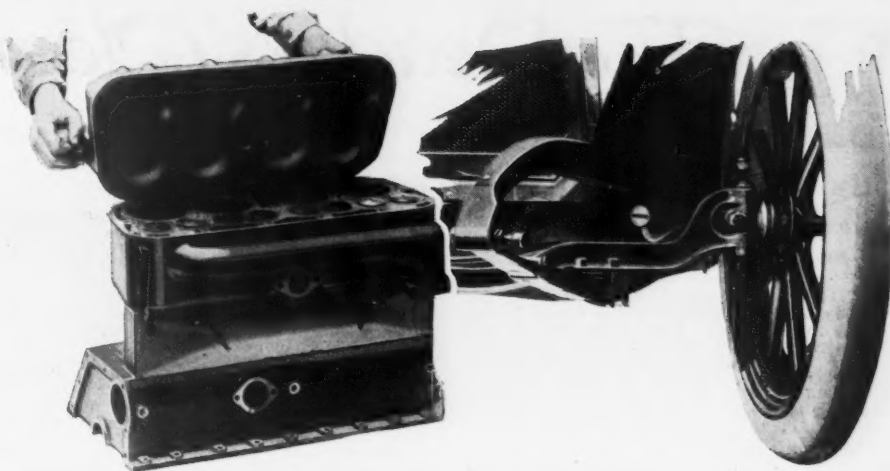


another to the front where it plays on the mesh point of the timing gears, serving to quiet them and prevent wear. The oil from these points of delivery flows down into the crankcase troughs to be splashed by the rod ends up into the cylinders. The front and center main bearings have oil pockets to catch the splash. The oil also splashes up into the valve tappets and to the camshaft bearings. Vents in the valve covers allow breathing up through the tappet holes and take the place of a breather pipe.

#### Rushmore Starter Retained

The inner edge of the flywheel face is provided with teeth which mesh with the pinion of the Rushmore cranking unit for starting purposes. This electric motor is mounted on the left rear side of the crankcase on an integral bracket and is a late type brought out by the Rushmore concern, model C1. Though very compact, this motor has a 7-horsepower output, and turns a stiff motor at 140 r.p.m. It is geared 6 to 1 in this installation.

In operation, the unit is very simple. Within the armature shaft there is a spring, which, when the unit is idle, holds the pinion on the armature shaft out of mesh with the flywheel gear. When in this position, the poles of the machine are out of line with the armature. The operating switch has two points. Throwing this to the first point sends a small current from the storage battery to the motor. This is sufficient to cause the armature to be magnetically drawn in directly in line with the poles and against the spring action. At the same time, the armature turns slowly, meshing the flywheel and pinion teeth. The switch is then thrown to the second point when the full current goes to the unit to turn the now-connected gasoline and electric motors. As soon as the engine rotates faster than the electric motor, the pinion is automatically thrown out



AT THE LEFT IS SHOWN THE CYLINDER HEAD OF THE REGAL MOTOR ABOUT TO BE REMOVED, WHILE AT THE RIGHT IS SHOWN THE FRONT AXLE, WHICH HAS A MODIFIED FORM OF YOKE CARRYING THE STEERING SPINDLE

of mesh with the teeth cut in the flywheel.

The generator which is carried on the right forward side of the engine, is driven by a flat belt. This belt passes over the main drive pulley on the end of the crankshaft, then over the fan pulley and generator pulley. Thus one belt serves a double purpose and is a positive drive when properly tensioned. To adjust this tension, it is only necessary to swing the fan arm. The generator is driven 2.5 to 1. In connection with the electric system, there is an 80 ampere-hour storage battery of Willard make which is carried on the runningboard, the designers believing this to be the most efficient location.

#### Running Gear Features

Regal cars retain the cone clutch of leather with spring inserts, and also the mounting of the gearset in unit with the rear axle. The drive shaft is inclosed within a torsion tube, which has a yoked front end attaching to the middle cross member of the frame. Just ahead of this yoke the drive shaft is fitted with a universal joint in accordance with general practice. The gearset itself, which bolts through flanges both to the torsion tube and the rear axle housing, is a Covert and affords three forward speeds.

The rear axle is of a new design and lighter than that formerly used. A three-quarter floating construction replaces the former semi-floating design and is more efficient. The differential is of the usual bevel-gear type with four differential pinions and the gear ratio is 4 to 1.

All the springs on the new Regal are

underhung from the axles, which gives a lower suspension of the car.

A new design of front axle appears, which is very much lighter than that heretofore used. The weight reduction is accomplished principally by the elimination of large spindle yokes. Those now used have a very much shorter distance between the upper and lower mountings of the spindle, which construction is said to be equally as strong as the old. To illustrate this weight reduction, it may be said that the front axle formerly used weighed 58 pounds, while the new type weighs but 36 pounds.

Control of the latest Regal model is unusual in that there are no spark and throttle levers in connection with the steering gear. The Atwater-Kent ignition system used, is of the automatic advance type, which does away with a spark lever, while the control of the throttle is principally by foot accelerator, although there is a form of throttle lever on the dash by means of which the motor may be set for any speed, the accelerator then being used to get higher speeds.

Ample room for five passengers is provided in the touring car, the rear seat of which measures 47 inches across.

One refinement which is unique is the removal of the radiator filler cap from the outside of the radiator. This filler is now placed underneath the hood and is an integral part of the radiator outlet connection from the motor. This has been done to prevent the unsightly rusting of the radiator surface, due to the overflowing of water when filling. It also has the advantage of giving an unbroken line to the radiator and hood, which adds to the appearance. Another refining touch is the coping-over of the front edge of the radiator.

In connection with the equipment the car is provided with a so-called one-man-top, which may be raised or lowered by one person. Demountable rims, carrying 32 by 3½-inch tires also are used. The complete weight of the car, ready for the road, is 2,345 pounds.



THE RADIATOR FILLER CAP ON THE 1915 REGAL IS UNDER THE HOOD, ALLOWING OF AN UNBROKEN LINE AND PREVENTING RUSTING OF THE RADIATOR SURFACE

# The Readers' Clearing House

## CAM DESIGN TO MAKE CAR SPEEDY

### Quick Opening and Closing of Valves Necessary for Good Performance

Nowata, Okla.—Editor Motor Age.—I am rebuilding a Ford motor and would like to change the camshaft. I would like also to give the valves more life and keep the valve open longer. I would like to know how to lay out the cams before starting to make them. I will pin the cams, as the camshaft in a Ford motor is made of one piece of stock.—H. M. Caulson.

The chief object in special cam design for racing is to give quick opening and closing and a rather long period of dwell; that is, to make the valve hold open as long as possible. In Fig. 2 is shown the cam contour suggested for a Ford racing car, where noise and wear are not considered important.

The difference in valve opening is indicated in Fig. 1, in which the heavy line is the opening given by the racing cam, and the dotted line is the one given by the ordinary touring cam. This need not apply particularly to the Ford car.

### TENDENCY TOWARD FOUR-CYLINDER

#### Reader States Two-Cylinder Motors Will Not Do for Cyclecar Use

New Haven, Conn.—Editor Motor Age.—There is no disputing the field of the cyclecar, a field so large that at present few realize its size, and in every opinion very few of the so-called engineers even seem to appreciate the demands that will be made of these very light cars. Over powering and cheap motors, coupled with poor mechanical designs will do more harm at the present time than can be overcome by spending large sums later in advertising. I have been a careful student of the English and American productions and believe that many companies will change their designs entirely before they are very successful.

It would seem that the fitting of a light two-cylinder, motorcycle motor was one of these mistakes. I know of a motorcycle motor of standard make and one having very large sales, that during the past year has broken three connecting rods on one and the same motor, all under exactly the same conditions, namely—climbing a slight grade carrying a passenger. This is a motorcycle. Now if this motor cannot stand up while being used under these conditions, what can be expected if fitted to a 650-pound car, carrying two people?

One manufacturer of a two-cylinder, air-cooled motor states in his instructions that his motor, being air-cooled, must be given plenty of oil, or as he states it a proper amount of oil.

Also the motor should not be run any length of time standing or it will overheat. What is the difference between a motor running standing (car standing) or a motor running and car running, but with a following wind?

I have driven many a mile with the wind blowing a gale, but have never felt it as it was blowing the same direction that I was traveling. Several of Motor Age readers have advocated an opposed motor and many objections have been advanced against this type—there are only two objections to it at present, and I guess they will continue some time, as you can't fit it by the ordinary methods—splash—and the public

does not seem to want it. Outside of that it is all right and cannot be equaled.

In the issue of April 30 one correspondent says that a motor  $3\frac{1}{2}$  by  $3\frac{1}{4}$  inch is ample. I quite agree with him, also I believe it should be water-cooled. Its length would not be 34 inches as you state, because flywheels would not be in the case as in the motorcycle motor, but would be about  $20\frac{1}{2}$  inches and nothing cut below practical limits. Do the buyers seem to want a two or four-cylinder motor?

I have a sketch of a cyclecar motor of  $2\frac{1}{2}$ -inch bore by  $3\frac{1}{4}$ -inch stroke, four cylinders, that is the most accessible thing I have ever seen. All the valve adjustments are in the open and not behind a carburetor and magneto, to say nothing of an exhaust pipe.

Outside of the patterns it is the cheapest motor to build that I have seen composed of three assembly units. Can Motor Age tell whether there is a demand for a strictly cyclecar 70 cubic inches motor?—A Reader.

The tendency at present, as you suggest, seems to be toward a four-cylinder proposition, not on account of lack of power in motorcycle types of power plant, but on account of hard starting and lack of flexibility. It is by no means certain, however, that the real cyclecar will be driven by a four-cylinder motor, as most

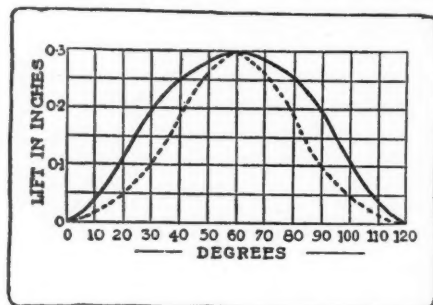


Fig. 1—Difference in valve opening obtained by racing cam and ordinary one. Heavy line indicates opening given by racing cam

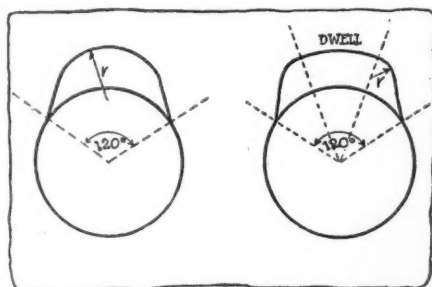


Fig. 2—Cam contour suggested for Ford racing car

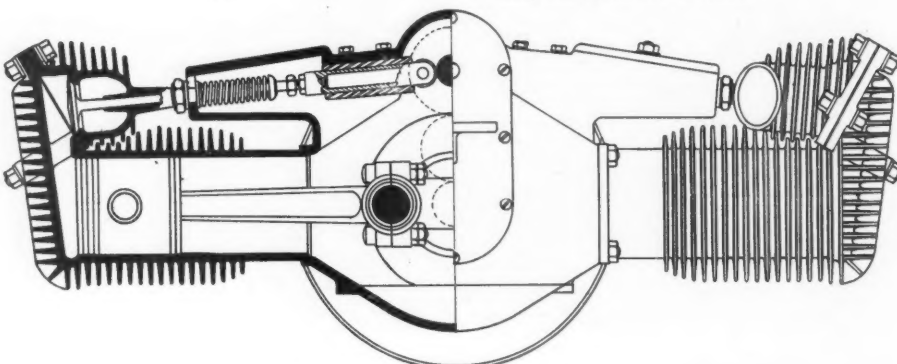


Fig. 3—Two-cylinder opposed engine, designed by A. A. Horton, for which many claims are made, chief of which is accessibility

of those now built are too heavy and powerful to be used in a car of under 700 pounds weight.

In new motors for cyclecars, such as the one you describe, one should watch out for the accessibility which you should have, and should also be careful to make a clean-looking job, with few corners to catch dirt, with all possible protection against leaking oil, with wires inclosed against shorting and the whole unit such as can be easily cleaned and be kept to a spick-and-span appearance. Appearance goes a long ways towards sales. There undoubtedly is a demand for motors such as you mention, provided it is properly built and that deliveries can be had in quantities.

### SUGGESTS SIMPLEST TYPE OF CAR

#### Interesting Ideas Incorporated in Design of Very Cheap Monocar

Dacono, Colo., Editor Motor Age.—The illustration in Fig. 5 is a possible type of cyclecar in one of its simplest forms. The arrangement of parts, you will see, is along the lines of present standard practice, the only departure being in the location of the engine, the use of steel tubing for all parts of the frame and bracing and the absence of an inclosed body.

The specifications suggested are as follows:

- Tread—30 inches.
- Wheelbase—96 inches.
- Engine—Twin cylinder, air-cooled, 12-horsepower, two-bearing crankshaft in unit with friction plate.
- Friction plate and disk transmission, 12-inch diameter, final belt drive.
- Front axle—Combination double spring axle.
- Steering gear—Standard practice, rack and pinion.
- Rear axle—Dead.
- Rear springs—Cantilever.
- Speed reduction—1 to 3.5 on high.
- Seat—Hammock type.
- Gasoline tank on rear of seat frame; gravity feed.
- Wheels—Wire, 28 inches diameter.

The advantages I claim for such a design are as follows:

- Lightest possible weight.
- Small air resistance.
- High speed.
- Easy riding on rough roads.

### Questions Answered and Communications Received

- H. M. Caulson.....Nowata, Okla.
- A Reader.....New Haven, Conn.
- C. W. Smith.....Dacono, Colo.
- A. A. Horton.....Detroit, Mich.
- R. O.....Clayton, Mo.
- T. Ross.....Detroit, Mich.

No communication not signed with the reader's full name and address will be answered.



Cheapest possible construction for all the above qualities.

Even the cheapest forms of the successful American cyclecar of the future will be required to have:

- 1—Safety.
- 2—Speed reduction.
- 3—Serviceability.

Other things may vary according to price and opinion, but these three the public will demand. A design along the above lines incorporates these three fundamental requirements in the simplest possible manner with the features necessary for safety at a high rate of speed. The biggest selling automobile of today bases its demand upon the combination of road speed, power, lightness, simplicity, cheapness and nothing else. With a lightweight, cheap cyclecar that can be wheeled into the shed or kitchen nights, that will run away from anything in its class on the road, it may be certain other lacking features will assume less importance in the eye of the average young motorcycle husky.

Thirty-inch tread is suggested because it can be wheeled in through all standard 36-inch doors and more nearly fits a double set of standard gauge wheel tracks than does a 36-inch tread.

The hammock seat can be made with an attached waterproof flap or lap robe to tuck around the feet and body when required.—C. W. Smith.

#### DESIGNS TWO-CYLINDER ENGINE Reader Has Made Accessibility of Parts a Special Feature

Detroit, Mich.—Editor Motor Age—I have noticed in Motor Age considerable talk about the opposed two-cylinder motor for cyclecars. The illustration in Fig. 3 shows my engine. I believe it has several points that are superior to others of this class. With all makes of this type, the last thing the designer thought of was ease of taking care of valves and cleaning cylinders of carbon.

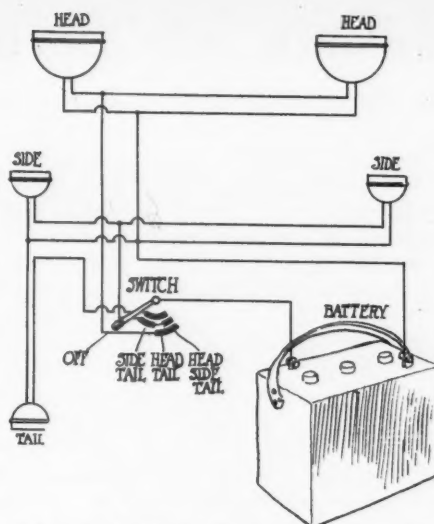


Fig. 4—Lighting system employing storage battery and a four-point switch by which various combinations may be obtained. It really corresponds to three separate switches

In the motor which I have laid out, the valves are placed in separate castings from the cylinders. This valve seat casting is bolted to the cylinder by bolts which, upon their removal, the valve spring cover can be placed in a vise and the valves reground with ease.

With this casting removed there is no danger of the valve-grinding compound getting into the cylinders, as is so often the case with this type of motor. A very large opening is made in the cylinder through which a scraper can readily remove carbon from the cylinder walls and piston top.

A single set of patterns for cylinder and valve seats is necessary as cylinders are interchangeable. All valves, valve springs and tappets are alike so only one set of spare parts is needed for repairs. The tappet guides are alike and are easily removed and new guides put in after wearing the old ones. Two bolts hold these

to the crankcase. The magneto is seated on ledge cast on the camshaft gear cover and is driven by the camshaft. The oiling is by splash system.—A. A. Horton.

#### SAYS DRIVEN DISK WEARS FLAT Reader States Green Transmission With Three Disks Overcomes Fault

Detroit, Mich.—Editor Motor Age—The specifications of the Ross cyclecar are as follows:

V-type motor. Bore  $3\frac{1}{2}$ . Stroke 4 inches. 15 horsepower.  
Friction transmission.  
V-belt drive to both rear wheels.  
Tread 36 inches.  
Ratio 3 to 1.  
Wheelbase 96 inches.  
Tires 28 by 3 inches.  
Weight approximately 400 pounds.

From the above one will see that it is a true cyclecar. Green friction transmission is to be used, which accounts for the low ratio on high. Through the cyclecar department I have learned that the common type of friction transmission delivers a maximum of 96 per cent horsepower and a minimum of 0 due to slippage of the driven disk when on dead center.

In the hands of users, this type causes more or less trouble by burning flat spots on the fiber or composition tire of the driven wheel. These two faults have been overcome in the Green transmission by having three driven disks instead of one operating on the driving disk which is undercut for one-third of its diameter.

Any ratio from 10,000 to 1 up to 1 to 1 may be had instantaneously. All three driven disks are placed on the jackshaft and inter-connected by bevel gears as in a differential, the center disk being splined to the shaft, with the two outer disks riding on its hub extensions.

By holding the center driven disk in the center of the driving disk which is undercut for one-third of its diameter, gives neutral, although the two outer disks are running an equal distance from center, but in opposite directions. By moving the driven unit to the left, which would be forward speeds in the car, the left driven disk would gain speed over the right, but in the opposite direction. For example, if it took 10 minutes for the left disk to gain a revolution over the right disk, it would take 20 minutes for the center disk to make one revolution, due to the differential action in its hub.

Owing to the friction surfaces being always in motion it can readily be seen the impossibility of burning flat spots on the diameter of the driven disks.—T. Ross.

#### Wiring With Four-Point Switch

Clayton, Mo.—Editor Motor Age—Kindly give a diagram showing how to wire a car for electric side, tail and dash lights using a storage battery located on the running board and three switches.

2—Using a 6-60 storage battery, about how many hours would a full battery last, all four lights burning steadily?—B. O.

1—Fig. 4 illustrates the wiring of the battery with the lamps and switch, which corresponds to 3 separate switches.

2—With two 16-candlepower headlights, two 4-candlepower side lights and a 2-candlepower tail light, this battery should give from 10 to 12 hours burning.

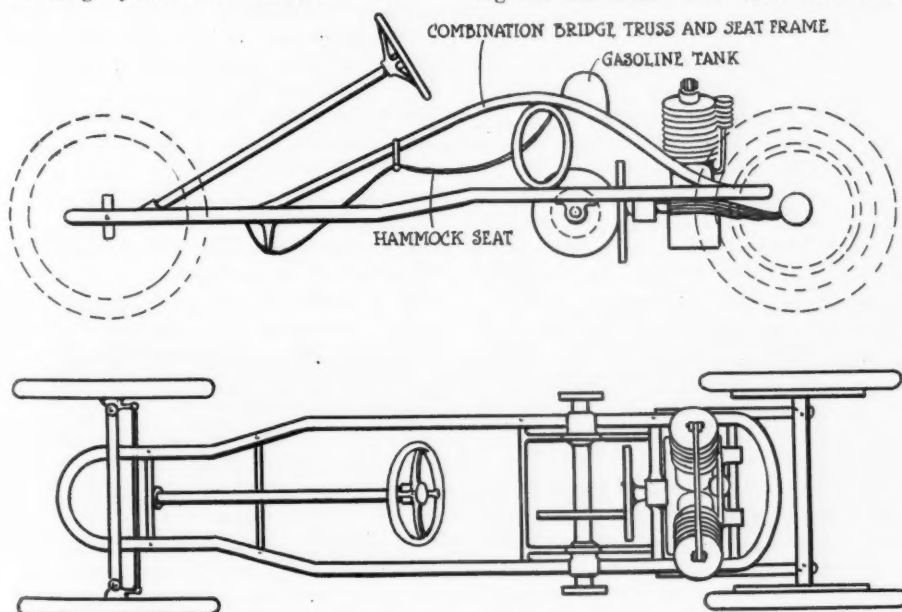
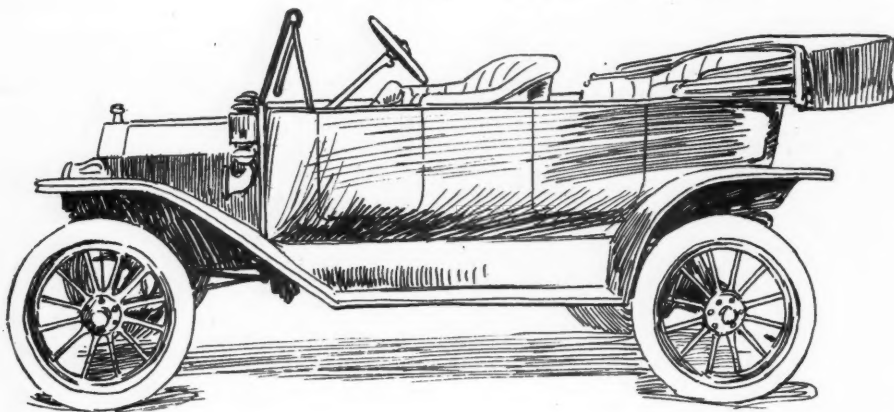


Fig. 5—The illustrations shown above are plans of a suggested cyclecar by a Motor Age reader. The motor is placed in the rear and the frame is made of steel tubing, but aside from these features it is similar to present types

# Transforming Used Cars Into Speedsters Is Profitable

## How One Repairman Makes Racers from Fords



**R**EPAIR shops are beginning to find a profitable specialty in remodeling used cars and converting them into speedsters of various types. There are many shops in various parts of the country which spend most of their time on this work, a fact which seems to indicate that the market for machines of this sort is large and growing.

The possibilities of a second-hand car which has been in service for three or four seasons usually are small, if it is to be sold as it stands. Smart buyers nowadays are looking for cars the design of which is nearly up-to-date, and which have not had enough use to destroy their looks. Hence a car made in 1910 or thereabouts, which has been driven 20,000 or 25,000 miles, is a very hard selling proposition, as about every dealer who has had experience in converting second-hand machines into coin of the realm will admit.

The speedster, however, occupies a field all its own. The man or boy who is looking for a car of this type does not want the conventional car demanded by 1914 designs, but on the other hand he wants something as unconventional as possible. The machine he has in his mind's eye is to be stripped to the bare essentials, geared high, carry a lot of special equipment which nobody else has, and, in short, have individuality sticking out all over it.

### Tripling Selling Value

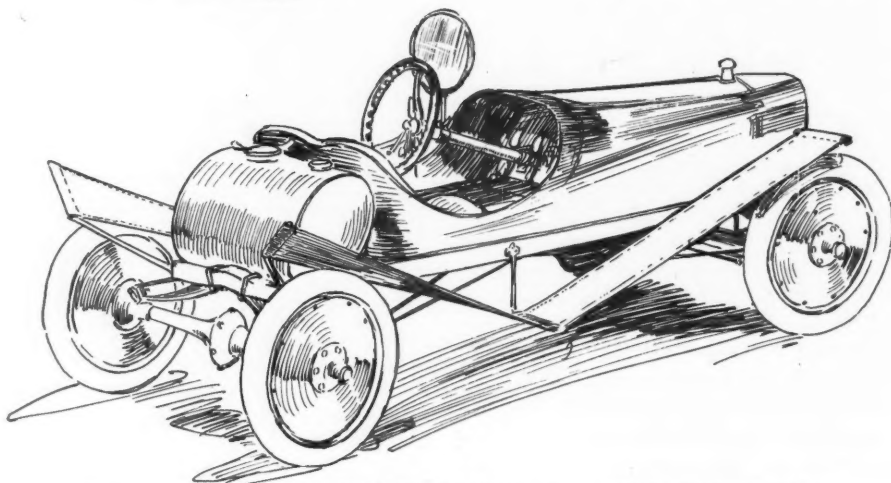
Most of these prospective owners are not in a position to buy a high-priced new roadster or runabout, and the old "junk-pile" in the dealer's shop looks good to him. In other words, a machine which would not sell for \$100 as it stands can be put into condition with comparatively little expense to bring from \$300 to \$500. That constitutes the repairman's opportunity.

John Boyd Kennedy, a young dealer of Louisville, Ky., is one of those who has gone into the new business, which does not interfere, however, with a regular repair trade. In fact, one of the main advantages of the business is that it frequently can be used to fill in dull time which other-

making it possible to carry out the basic idea, which is to have little more than the motor and running gear.

It usually is necessary in remodeling to purchase a large number of additional parts, and one difficulty comes into play here, as some of the factories price their parts at a higher figure than they would list at in a new car. This is one reason why Kennedy leans to the Ford, whose parts may be had at little over the price at which they are figured into an assembled machine.

In remodeling, the first step is to strip the car to the engine and running gear.



BEFORE AND AFTER THE TRANSFORMATION OF A FORD TOURING CAR INTO A SPEEDSTER

wise would be a burden on the concern. At it is, there is usually a car or two undergoing remodeling, and the repairmen are kept busy on them when nothing of a more pressing nature is to be given attention.

Mr. Kennedy got into this line largely on account of a demand for cars like his own, which is one of the converted type. It is a Ford which was bought in 1908, has been used for touring—one trip from New Orleans to New York being on its record—and has 150,000 miles to its credit. He remodeled this car by cutting down the body, placing the seats from an old Brush practically flat on the machine, though tipped at a slight angle, lowering the steering-post and taking out the dash. A large copper gasoline tank was placed at the rear, a false nose of brass placed over the radiator, and steel plates set on the inside and outside of the wheels, giving them a solid appearance.

"Riding around in this car was all the advertising I needed," said Mr. Kennedy. "After that I got all the business I could attend to."

The main question involved in turning an old car into a new one is whether or not the engine is in good condition. In most cases it is found to be in fine shape,

To make the necessary leg-room after the body of the car is leveled, it is necessary to set the seats back 8 or 10 inches. In order not to have the gear levers too far away from the driver, the rods must be lengthened and the levers and emergency brake moved back in accordance with the new position of the seats. The levers, of course, are too high for use in the low seats, and are cut down, a change which reduces the leverage and makes gear-shifting a little more difficult than is usually the case. The clutch and service brake pedals must also be shifted in the readjustment of the floor space. The cutting and changing of transmission rods requires forging, which few shops are in a position to do themselves, but this work can be done in any blacksmith shop at a comparatively small charge.

### Gearing for Speed

Gearing up the transmission is next accomplished, Mr. Kennedy's idea being usually to set it at 2 $\frac{1}{2}$  to 1. This gives the car a capacity of about 60 miles an hour, which is none too great for the youths who require these machines.

A rather difficult task in connection with the job is dropping the steering wheel. The 48-inch post found in the Ford is taken out and a 60-inch post inserted, the in-



creased length being necessary on account of the change in the angle and the fact that the driver is sitting farther back. A larger wheel, with the center lower than the circumference, is next attached, small wheels of the inverted type used on the Ford making steering too difficult on the speedster. The wheel usually used by Mr. Kennedy is 17 inches in diameter and is made by the American Wood Rim Co., Ottawa, Mich.

#### Removes Fenders

In order to give the car the proper racy appearance, fenders are practically done away with, and running-boards also are eliminated. To protect the driver in bad weather, movable mud-guards are provided by setting angle irons at the front and rear of the car. A straight piece of narrow canvas is slipped over these in bad weather, successfully keeping off the mud. The canvas is sewed with a hem at both ends, so that it may be slipped easily over the iron. When the weather is good and the going dry, the guards are carried in the tool-box.

The body usually is sawed off with a scroll-saw to within 1 inch or 2 of the running gear, after which the seats are placed and the floor extended back from the seats to the rear of the car. The gas tank, which has a capacity of 20 gallons, and the tool-box are placed in the rear, while it is of course practicable to fit up this portion of the car with a trunk and other equipment to be used in touring.

False fronts and filled-in wheels are easily fitted to the machine. Windshields of isinglass and gummed cloth may be set, of

a size barely sufficient to cover the driver, but regulation windshield and top are disdained. The shield which is provided of course is removable. The gasoline feed is by gravity.

Kennedy recommends that the best plan is not to attempt to buy old machines and remodel them in advance of orders, but to rebuild them to the specifications of the owner. In fact, the more individual and freakish ideas the convertor can suggest, the better the driver of the car will like it. That is the reason why it is well not to anticipate his wants in advance, but to build up the car along individual lines determined by the caprices of the purchaser. When a man is in the market for such a car, it is an easy matter to pick up a used machine which will answer the purpose, and then reconstruct it along lines to be determined.

#### Flat Charge Best

Occasionally a car is remodeled on a time basis, the customer being charged for labor and materials just as in the case of an ordinary repair job, but the plan mostly in favor is to make a flat charge for the remodeled car, after having it understood exactly what is to be done to it. Mr. Kennedy believes that more money can be made in remodeling cars for service of the kind suggested than for use as light delivery wagons, as the man who is looking for a car of the latter type is usually distinctly limited in the amount he intends to pay, and likewise gives the car harder service, with corresponding dissatisfaction if not entirely pleased with his purchase.

of the first floor for materials for foreign shipment and the balance of the building for upholstering and general shop and factory work. The construction of this building is now completed up to and including the third floor. This is known as building No. 45.

Building No. 46 will be an immense body plant, 200 feet by 410 feet, including two stories and basement. This building is entirely given over to the manufacture of bodies. It is of the most modern construction throughout, excellently lighted by windows, which make the side walls, from 4 feet above the floor to the ceiling, practically nothing but glass. This building is entirely completed.

A power building is 162 feet by 134 feet, built of brick and containing four 500-horsepower McNaul water tube boilers. These boilers are fed by stokers with the wood refuse from the body plant. In connection with the power plant is a new brick chimney 205 feet 3 inches high, 18 feet 6 inches in diameter at the base, and 12 feet 5 1/4 inches in diameter at the top. The boilers heat both of the large new buildings, furnish steam for the new dry kiln and for the hammers in the forge.

The dry kiln is situated back of the body plant and is 236 feet by 144 feet. It contains 10 kilns, 5 on each side, and includes an ingenious system of tracks to facilitate the handling of lumber. This lumber is taken from the cars and placed on dry kiln tracks which operate on tracks on a loading platform. The trucks are then hauled to the end of the platform where they roll onto other trucks which bear tracks of their own. These latter trucks operate at a right angle, placing the dry kiln trucks in front of any chosen kiln into which are tracks on which they are hauled. The capacity of the dry kiln is 12,600 feet of 3-inch lumber; 6,300 of 1 1/2-inch; 9,450 feet of 2-inch; 3,150 feet of 2 1/2-inch; 7,875 feet of 3-inch; 2,205 feet of 4-inch per day of 24 hours.

There is also being constructed an addition to the blacksmith shop—100 feet by 70 feet. This includes a basement and one story. The basement is to be used for die storage and a sub-station for the transformer house.

There is also under construction a tunnel under the railroad tracks for the purpose of taking cars to the testing track without having to cross the railroad tracks.

#### FRANKLIN REPORTS PROSPERITY

Syracuse, N. Y., June 22—One thousand three hundred cars, all of one model, have been shipped from the Franklin factory in this city since October 1, 1913, showing an increase of 61 per cent over the same months last year. Figures compiled at the factory, showing the business up to April 30, point to great success for the six-thirty model, the only one now manufactured by the company. At present the factory is turning out twice as many cars of one design as were manufactured of all designs a year ago.

## Milwaukee Has State Ford Owners' Day

### 3,000 Take Part in Demonstration

MILWAUKEE, Wis., June 21—More than 3,000 Ford owners from all parts of Wisconsin, a number from the extreme northwestern section, 400 miles from Milwaukee, participated in the first annual Wisconsin Ford owner's day at Milwaukee on Saturday, June 20. The affair was arranged by E. C. Schumann, a Milwaukee Ford enthusiast, who invited practically every one of the 12,000 Ford owners in Wisconsin to take part.

At 4 o'clock there was a parade of decorated Ford cars, but only 277 took part, according to the judges of an open contest for a Ford roadster, valued at \$500, awarded to the person making the nearest guess as to the number of cars actually participating in the procession. Seven people guessed number 277.

Prizes also were given for the best looking car, car coming the longest distance, etc. A Ford from Superior, Wis., at the Head-of-the-Lakes, won the distance prize.

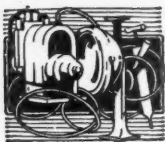
In the evening the Forders repaired to the Milwaukee motordrome, where a contest between two stripped Fords was made

the feature of the motorcycle racing program. The Fords negotiated the dangerous track without mishap, and one was able to maintain itself near the top of the 58 degree incline successfully. The best time for 1 mile was 1:17 and for 2 miles, 2:31. The track is a quarter-mile circle built for cycle racing, in which speeds of 90 miles an hour are maintained.

The Ford day was a splendid boost for motor supply business and brought many dealers to Milwaukee. The Hickman-Lauson-Diener Co., Milwaukee, state agent for the Ford, was associated with the event only as donator of the Ford roadster given as grand prize in the guessing contest.

#### ADDING TO OVERLAND PLANT

Toledo, O., June 22—The Willys-Overland Co. has, for several months past, been making extensive additions to its Toledo plant. Of these buildings, one is to be 410 feet by 500 feet, having four stories and basement and built entirely of reinforced concrete set on concrete piling. The basement will be used for storage, part



# The Accessory Corner



## To Remagnetize Magneto Magnets

SO many repairmen, amateur and professional, have been looking for a magnet charger, but the Peerless Mfg. Co., Rock Island, Ill., probably will make a hit with its Peerless magnet charger which it has just placed on the market. It is designed to be used with a 6-volt storage battery or six common dry cells and is said to require from 15 seconds to 1 minute to charge a magnet thoroughly. The cost amounts to less than 1 cent. The Peerless company states that one charge of the common size of 6-volt storage battery will charge from 200 to 300 magnets. It is illustrated in Fig. 2.

## Lap Scoring Device

This year's 500-mile international sweepstake race at Indianapolis witnessed two different devices for overcoming the difficulty of keeping track of the number of laps on the brick oval made by each car. One of these, the Trego, was described in the June 4 issue of Motor Age. There was another one, shown in Fig. 7, in the timer's stand, the invention of an Indianapolis man.

## Positive Vulcanizers

Patents have just been granted to the Positive Supply Co., Davenport, Ia., on its positive portable steam vulcanizer. This is made expressly for use in private garages and small repair shops and for roadside repairs. The entire outfit weighs but 4 pounds, so it can be carried in the tool kit of the car.

The vulcanizer consists of a metal body with a compartment for water and a compartment for fuel. The water compartment is between the flame and the tire, where it equalizes the heat generated and prevents burning the tire. It will repair both inner tubes and casings and will vulcanize casings without removing the tire from the wheel. It sells for \$3.50.

## M. E. Oxygen Generator

The rapid increase in the popularity of the oxygen process of carbon removal has resulted in the development by the Auto

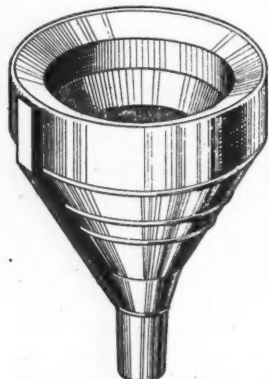


FIG. 1—ENTORF GASOLINE FILLER

It resembles the conventional type of funnel but it is used for separating water and dirt from the fuel

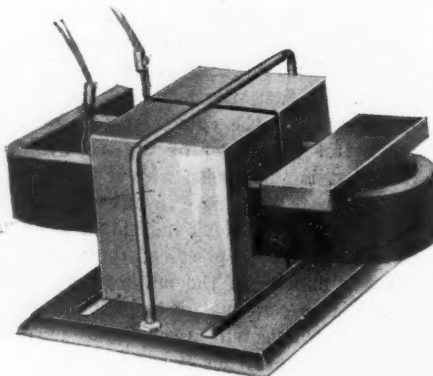


FIG. 2—REMAGNETIZING MAGNETO MAGNETS

A 6-volt storage battery furnishes enough current for this recharger

Gas Light Co., Hazelton, Pa., of an outfit for generating the oxygen. This is in reality an oxygen producing plant on a small scale, and relieves the user of any danger of being held up through delays in receiving oxygen gas storage tanks, also there is no rental or transportation to pay on full and empty tanks. This can be used also in oxygen-acetylene welding and a special torch is offered for this. These are sold by Fisher, Richards & Carr, Hazelton, Pa.

## Moto Motor Tonic

Under the name of Moto Motor Tonic, a new liquid decarbonizer is being placed on the market by the Moto Motor Tonic Co., Wichita, Kan. The decarbonizer is fed through the air intake of the carburetor. It is stated that if it is fed to the engine about once every 2 weeks, the rings and valves will be kept clean and carbon will be kept from forming, while if from 1 pint to 1 quart is fed 3 days in succession bad cases of carbonization will be cured. It retails at \$3 a gallon.

## Automatic Monkey Wrench

The Automatic Wrench Co., Boston, Mass., is manufacturing the Barnsley automatic wrench. This is a quick-acting wrench which can be quickly adjusted to size and can be used with one hand. It opens automatically, locks automatically and is instantly adjusted. There are no screw adjustments of any kind. There are no teeth and no ratchet. The Barnsley is operated by placing the object to be turned between the jaws and pressing the jaws in until it strikes the object. The patent automatic locking clutch locks it in position. A slight pressure on the clutch and the jaws springs open. It is stated that it can be adjusted to .001 inch. It is made in four styles, one of which is the S type, shown in Fig. 5.

## Spare Tire Holder

Patent papers have just been issued to Wilbur N. Eiskine, Evansville, Ind., on a locking spare tire holder, and is to be

put on the market by him, manufacturing arrangements having been completed. The tire holder consists of a Y-shaped standard, which is bolted in an upright position to the runningboard or to the rear of the car, the ends of the Y taking the tire or demountable rim. A feature of the device is the locking arrangement by which a clamp is placed over the lower

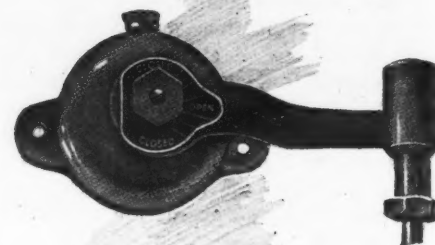


FIG. 3—HOUDAILLE SHOCK ABSORBER

This is a French invention and operates on the principle of the recoil device used on cannons

portion of the rim and held by a pin to the standard, which in turn carries the padlock, thus preventing theft of the tire.

## Entorf Gasoline Filler

To separate from the gasoline the water which it sometimes contains, the Entorf Filter Co., Amboy, Ill., has produced the Entorf water separating filter. In appearance it resembles the common tin funnel, but near the top it has a screen so fine that when oil or gasoline is poured upon it, a film is formed through which water will not pass. Above this screen is an opening into a drain duct or vent on the outside of the filter which water can enter. Below the first screen is a second one and another opening into the drain

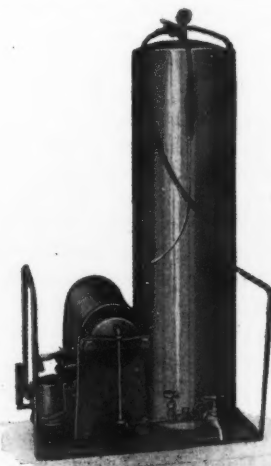


FIG. 4—M. E. OXYGEN GENERATOR

With oxygen in use for various operations about the repair shop this oxygen generator should find admirers



duct. At the bottom of the filter is a mechanical device so arranged so that the oil will pass through into the spout, while the heavier substances will go into a reservoir which discharges into the drain duct. The Entorf is shown in Fig. 1.

#### Angle Tank Filler

Owners of cars with cowl gasoline tanks will appreciate the Angle tank filler recently patented by C. D. Angle, Flint, Mich., and which shortly will be placed on the market. The illustration in Fig. 9



FIG. 5—AUTOMATIC MONKEY WRENCH

*This wrench may be adjusted to size quickly and can be operated with one hand, for it opens and locks automatically*

shows the construction. The filler consists of a telescoping tube, the inner portion of which serves both as an extension filler and a filler cap. The inner portion cramps itself while in a filling position so that movement in any direction will not occur unless force is applied. The hole is so cut in the tube that a funnel fits snugly

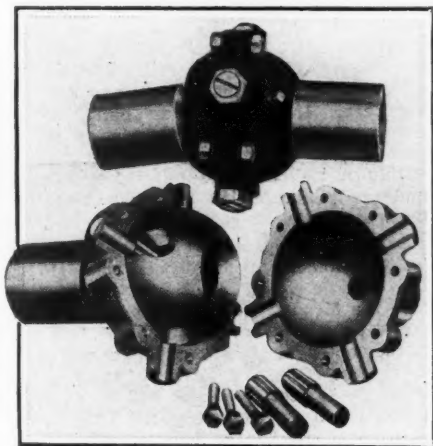


FIG. 6—STANDARD UNIVERSAL

*The feature of this joint is that it is fitted with roller bearings to take care of the driving torque*

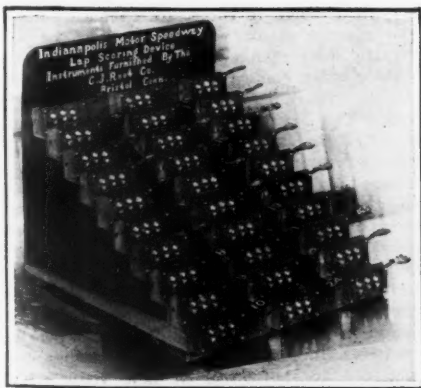


FIG. 7—LAP SCORING DEVICE

*This instrument, the invention of an Indianapolis man, was used at the last 500-mile race for checking the number of laps each car traveled*

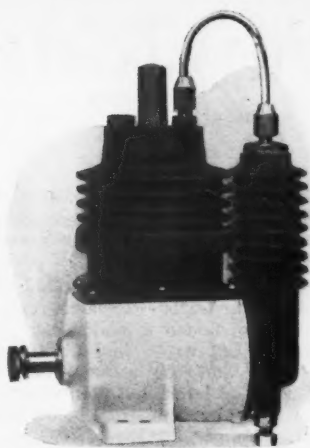


FIG. 7—M. P. MOTOR TIRE PUMP

*This two-cylinder pump can be connected to the engine and furnishes air for the tires or storage tank*

into it. It can be applied very successfully to tanks under the seat, letting the cap come flush with the heel board and thus save raising the cushion while filling. Some rear tanks are so located that this filler should prove convenient.

#### M. P. Motor Tire Pump

The National United Service Co., Detroit, Mich., is marketing a two-cylinder power pump, designed to be connected to the motor car engine. The cylinders are  $1\frac{1}{2}$  by  $1\frac{5}{8}$  inches in size; the oil is prevented from getting to the tire by means of a patent air trap. The pump, shown in Fig. 7, can be mounted by any garageman in any car at small cost, it is stated.

#### Roller Bearing Universals

The Universal Machine Co., Bowling Green, O., is manufacturing Standard universal joints, whose feature is that the joints are fitted with roller bearings. Each joint is a ball and socket. The ball and socket take care of the up-and-down motion, and end thrust and all other strains, while the four roller bearings mounted on pins take care of the driving torque. The joint is adjustable for wear, and requires greasing only once a season, which takes 5 minutes' time. It is dust-proof in construction and does not need a boot. The Standard is shown in Fig. 6.

#### Houdaille Shock Absorbers

Houdaille shock absorbers, made by Lenaous, Paris, France, and distributed in America by the Benz Automobile Sales Corp., New York, operates on a principal identical with that of the recoil absorbing device used on cannons. The compensating suspension is made positive by a rotary-paddle piston compressing castor oil and forcing it through by-passes provided for the purpose. The oil thus forced by abnormal pressure, through the by-pass, automatically deadens the jar. The recoil is eliminated by action of the oil being returned from the compensating reservoir by means of suction. These list at \$90 per set of four.

#### Mayo Electric Garage Pump

Free air as a sales magnet for garages is a feature which is being appreciated

more each year. The Mayo Mfg. Co., Chicago, has just put on the market a new design of electric garage pump for this service. The equipment consists of a two-cylinder pump, driven by  $\frac{1}{4}$ -horsepower electric motor through silent-chain drive. The pump is kept cool by a constant flow of water around the waterjacketed cylinders supplied from a water tank located over the electric motor. To eliminate any chance of burning out the electric motor by starting against too heavy a resistance,

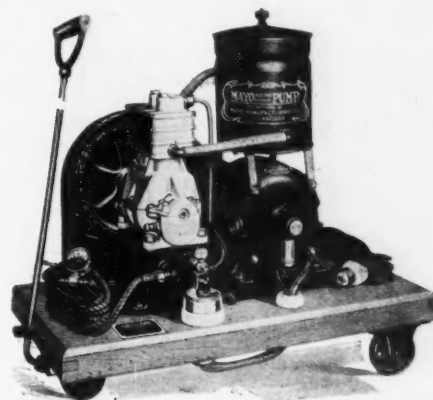


FIG. 8—MAYO ELECTRIC GARAGE PUMP

*This is a new design and consists of a  $\frac{1}{4}$ -horsepower electric motor and a two-cylinder air pump*

an auxiliary tank is located under the pump. This is fitted with a check valve outlet to the hose which connects with the tire valve. It also is fitted with a pet cock which opens automatically when the starting switch is turned off.

Consequently the motor always is started up against the pressure of the empty tank, permitting it to speed up before it encounters heavy tire pressures. The outfit is mounted on heavy oak base fitted with casters and a long handle is supplied for moving it about. Ten feet of electric wire and 12 feet of hose and a gauge are supplied. The pump has two cylinders. The waterjacket permits a speed of 600 r.p.m. The oiling system is designed to prevent oil getting into the tire. The outfit shown in Fig. 8 sells for \$75.

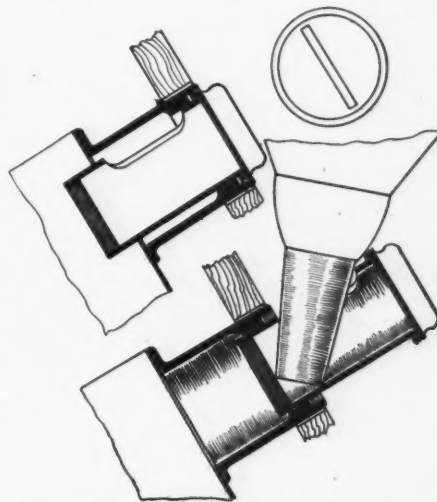


FIG. 9—ANGLE TANK FILLER

*This device will be welcomed by owners of cars with cowl fuel tanks. It makes tank filling easy and clean*



# From the Four Winds



**Eighty Years old; an Ardent Motorist**—Mrs. Mary Burt of Armington, Ill., who is 80 years of age, has just purchased her second motor car. With a maid for a companion she drives many miles annually, making long-distance tours. Men are strictly taboo and the two women are always alone. Mrs. Burt is said to be the oldest woman driver in the west.

**Russia to Hold Odd Contest**—An endurance contest will be held in Russia the latter part of August. It will be a run of 2,500 miles, known as the Coupe de l'Empereur. The contest is conducted by the Grand Army of the Empire and the Russian Automobile Club, for the purpose of ascertaining the motor car which will be the most durable under Russian road conditions. The prize winner will receive an order for 250 cars; second prize is 150 cars; third prize is 100 cars, and the fourth prize is fifty cars.

**To Improve Lincoln Highway Link**—Whiteside county, Illinois, will expend \$16,000 in improving the Lincoln highway through that county. The highway association will present 2,000 barrels of cement to the county. It is proposed to construct about 3 miles of concrete road, 10 feet in width with a 2-foot shoulder of gravel or crushed rock. Such a road will cost about \$7,000 per mile. The board of supervisors voted an appropriation at a meeting this week. The road will run east and west of the city of Morrison. The state will authorize the survey and approve the work after it is completed.

**Indiana Selling Many Tags**—The Indiana secretary of state is now issuing motor car licenses at the rate of 150 a day and the most of these are going to rural districts and small towns. There were 53,511 motor car licenses issued from January 1 to June 15, inclusive. In 1913 there were about 45,000 licenses issued. Licenses on second-hand cars are being transferred at the rate of from ten to twelve a day. The state has issued this year licenses for 8,597 motor-cycles, for 2,250 professional drivers and for 480 dealers and manufacturers.

**Junior Mercers Win**—The Junior Indianapolis sweepstakes meet for miniature cars was run recently at Los Angeles, Cal. In the 15-mile event for two-cylinder models the little Mercers made a cleanup. Matt Haines was first in his No. 4, and young Harold Lamb was second. Haines' time for the distance was 18 minutes 34½ seconds. This represents an average speed of approximately 48½ miles an hour. In the big race, which was for a distance of 40 miles, Haines was proclaimed the winner, but it finally developed that Hartz was the victor, the judges having been somewhat confused at the finish.

**To Inspect New Highway**—Governor Edward Dunne of Illinois has accepted an invitation from the officers of the Springfield-Hannibal division of the Ocean-to-Ocean Highway Association, and will accompany the inspection party over this road on June 24. This will be the first inspection tour over the new highway. Governor Dunne and the central Illinoisans will leave Springfield at 7:30 a. m. on June 24. Another party will start from Hannibal, Mo., at the same hour. The two will meet at Griggsville, a midway point, where a good roads picnic will be given. Governor Dunne will deliver the principal address and will talk in behalf of good roads. The Springfield-Hannibal association was organized at

Griggsville on March 13 last. Since then, a large sum and much labor have been expended in improving the highway and it is proposed to expend more.

**Oarsmen in Motor Contest**—The Century Boat Club, St. Louis' exclusive rowing organization, conducted a motor car tour for its members last week, through the streets of St. Louis and the county roads. The winner was declared on points scored in efficiency and knowledge of the traffic rules. John H. Phillips, driving a Hudson, and George M. Fox, in a Staver, were declared winners, each having a perfect score of 1,000. Six cars finished in second position; that is, each had a percentage of 992.

**Iowa's Car Wealth \$115,000,000**—Iowa will have \$115,000,000 invested in motor cars at compiled on the basis of registration to date. This will mean that the car wealth of the state will be just twice as great as it was in 1913. Over 86,000 cars already have been registered in Iowa this year. The entire registration for last year was only 65,000. Thus the number already registered for 1914 is 21,000 in excess of the total for 1913. State officials make a conservative estimate based on former years that the total regis-

tration for this year will be 115,000. If the average valuation is \$1,000 the total value of all the cars in the state will be \$115,000,000.

**Victory for Horsemen**—At the regular monthly meeting of the Fairmount Park commission, of Philadelphia, a petition was presented to the commissioners to have Wissahickon drive, heretofore reserved solely for horses and pedestrians, opened to motor traffic, was refused. A petition signed by 276 horsemen who regularly use the drive was lodged against the motor car enthusiasts' request and accepted by the commission.

**Garage Men May Combine**—There is talk now in Worcester, Mass., of a combination of the garage men there so that some sort of a price schedule may be worked out that will meet the approval of all firms in the business. The new garage law will eliminate a number of garages in the Bay state by October 1 next, and it is proposed to get some organization worked out so that those remaining in business may arrange rates that will be standard.

**Denver After Country Home**—A committee of fourteen has been selected by the Denver Motor Club to find a suitable site for a country home, the same to be purchased and owned outright by the club as a permanent asset. The committee is instructed to negotiate for the choicest site obtainable, either with or without buildings for club purposes. If necessary to build, a club house of the most improved design will be constructed. The property will be somewhere within a radius of 20 miles from Denver and easily accessible. The new place will be opened this season if possible.

**Safeguarding Meadow Boulevard**—Preliminary arrangements have been completed by the Atlantic county, N. J., officials to resurface the Meadow boulevard approaching Atlantic City with hard material 30 feet wide in the center for the accommodation of motor cars. The remaining 15 feet of the roadway, which is 45 feet in width, will be of gravel construction for slow traffic. This method is believed to be the best solution of the problem of reducing the number of accidents, which, by reason of the increased and increasing motor travel, is becoming alarmingly numerous.

**Licensed Chauffeur Required**—The Massachusetts supreme court has just handed down a decision to the effect that all persons who operate motor vehicles for hire, or who operate their own vehicles for hire or when rented, must secure a special or chauffeur's license, otherwise they will be violating the laws. The Massachusetts highway commission has just sent notices to motorists that any such owner who now has an operator's license and rents his car must secure a the close of the year 1914. This is the estimate of the state department from figures chauffeur's license, which costs \$2 more, as well.

**Michigan's 1914 Tag Business**—Thus far this year 63,000 motor car licenses have been issued in the state of Michigan. This is already an increase of 8,634 or 15.8 per cent over the total for all of last year, which was 54,366. At the rate of \$3 each, the motor car licenses have thus far augmented the state treasury by \$189,000. Chauffeur licenses thus far issued number 3,774. In 1913 all told 4,837 were issued. The number of motor cycle licenses issued thus far is 5,524. The total for 1913 was 5,699.

## Coming Motor Events

### SHOWS AND CONVENTIONS

September 26-October 6—Berlin show.  
October 7-17—Electric vehicle show, Grand Central Palace, New York.  
October 17-24—Show, Pittsburgh, Pa.  
October 16-26—Paris show.  
November 6—Olympia show.  
November 9-14—American Road Congress, Atlanta, Ga.

### CONTESTS

June 27-July 4—National touring week.  
June 30—Track meet, Sioux City, Ia.  
July 4—French grand prix, Lyons.  
\*July 3-4—Montamara Feste road races, Tacoma, Wash.  
\*July 4—Three hundred mile race, Sioux City, Ia., speedway.  
July 4—Track meet, Providence, R. I.  
July 4—Hill climb, Richfield Springs, N. Y.  
July 4—Road race, Prescott, Ariz.  
July 17-18—Speedway races, Seattle, Wash.  
August 1 and 3—Beach meet, Galveston, Texas.  
July 25-26—Belgium grand prix road races.  
August 15—Le Mans cyclecar grand prix race.  
July and August—French army truck subsidiary trials.  
August 2-9—Six day cyclecar reliability in French Alps.  
August 16—Coupe Internationale; light car race, Le Mans.  
August 17—Grand Prix of France, Le Mans.  
August 21-22—Road races, Elgin, Ill.  
September 5—Track meet, Milwaukee, Wis.  
September 6-7—Italian grand prix.  
September 7—Track meet, Providence, R. I.  
September 9—Road race, Corona Beach, Cal.  
September 14—Track meet, Milwaukee, Wis.  
September 18-19—Track meet, Hutchinson, Kans.  
October—Gallien hill climb, Paris.  
October 2-3—Track meet, Oklahoma City, Okla.  
October 2-3—Track meet, Trenton, N. J.  
November 8-11—Track meet, Shreveport, La.  
November 15—Kerosene motor tests, Paris, France.  
November—El Paso-Phoenix road race.

\* Sanctioned by A. A. A.





# Among the Makers and Dealers



**Cut Block Tire Price**—The Goodyear Tire and Rubber Co. has announced a reduction of approximately 5 percent in the price of individual block motor truck tires.

**Dividend Declared by Goodrich**—The Goodrich Rubber Co. has declared the regular quarterly dividend of 1¼ per cent on the preferred stock, payable July 1 to stockholders of record June 19.

**Gray & Davis Dividend Declared**—The directors of Gray & Davis, Inc., have declared a quarterly dividend of 1¼ per cent on the preferred stock payable July 1, 1914, to stockholders of record at the close of business June 22.

**Ford Outgrows St. Louis Branch**—The Ford Motor Co.'s St. Louis branch has already outgrown its building and last week a three-pole circus tent was erected to cover the yard, 150 by 100 feet, to provide additional space. The tent also will provide a parking space for assembled cars. Starting this week the plant started to assemble forty-five cars daily, fifteen more than the present output.

**Cleveland Designers Organize**—Organization of Cleveland motor car designers into a branch of the American Society of Automobile Engineers is the aim of a committee appointed at a recent meeting. The committee includes W. R. Strickland, R. W. Nightingale, A. S. Scaife, Christian Gird and J. H. Hertner, all connected with the Cleveland motor industry. There are nearly 100 designers in Cleveland's motor car industries and the city is the geographical center for 800 members of the national association.

**Oldberg to Move**—The Oldberg Mfg. Co., which makes mufflers, now located at Beaubien and Champlain streets, Detroit, will move in a few weeks into its new plant on Forest avenue, a three-story fireproof structure 60 by 120 feet. The concern is making 400 to 500 mufflers a day but is handicapped by its present cramped quarters. Vergin Oldberg, who was service manager of the Hudson Motor Car Co., and also engineer of the Bartholomew company, is sales manager and consulting engineer of the company.

**To Build Gas-Making Machines**—With an authorized capitalization of \$1,000, the Sun-Lite Gas Co. has been organized and incorporated at Indianapolis to manufacture gas-making machines. The plan is to sell these machines to persons who will undertake to manufacture gas and refill all kinds of motor car and motorcycle gas tanks in their respective localities. The company was organized by Orion K. Stuart, who has been identified with various concerns interested in gas lighting for motor vehicles. With him are associated Clarence A. Tucker and Kathryn P. Tucker.

**Boston Dealers Elect Officers**—The annual meeting of the Boston Automobile Dealers' Association was held recently at the headquarters at 5 Park Square. The question of space for the next show was discussed briefly and Secretary Chester I. Campbell was instructed to prepare blanks and receive applications for the 1915 show which will be held in Mechanic's building on the same dates in March as this year. The election of officers resulted in the following being chosen: John H. MacAlman, Stearns-Knight, president; Josiah S. Hathaway, White, vice-president; F. A. Hinchcliffe, secretary; J. W. Maguire, Pierce-Arrow; J. W. Bowman, Stevens-Duryea-S. G. V.; E. A. Gilmore, Chalmers-Saxon; Frank E. Wing, Marmon;

C. P. Rockwell, Jeffery; Charles E. Fay, Ford, and the other officers of the board of directors.

**Electric Show October 7-17**—The electric vehicle show will be held in Grand Central Palace, New York on October 7-17, that is starting on a Wednesday evening and closing on the second following Saturday night. The show is under the direction of Charles Parker, of the New York Edison Co.

**Gary Company to Market Cars Soon**—The Gary Automobile Mfg. Co. of Gary, Ind., will soon have its cars on the market. The company was organized a month ago and its cars are being designed by E. T. Birdsell. The company will build a six-cylinder chassis with 3¼-inch bore and 5½-inch stroke. Two types of bodies will be offered, one a touring car and the other a speedster.

**Warner Out of Gear Company**—Thomas W. Warner, president and general manager of the Warner Mfg. Co., Toledo, Ohio, and the T. W. Warner Co., Muncie, Ind., has withdrawn from and ceases his connection with the Muncie Gear Works, Muncie, Ind. Mr. Warner states he never was interested in the company, but only gave his time and influence to the institution for the benefit of its creditors, of whom he is one of the largest. Mr. Warner states he has worked hard in an effort to adjust its obligations and that the company now is practically out of debt and with careful management should develop into a substantial industry, and no doubt eventually retire the entire

## Recent Incorporations

**Brooklyn, N. Y.**—Miller & Van Winkle, capital stock \$150,000; to manufacture metal springs, motor car accessories; incorporators, C. L. Miller, E. M. Miller, G. P. Brush.

**Brooklyn, N. Y.**—Spencer Garage, Inc., capital stock \$5,000; incorporators, J. O. Spencer, Jr., Anne E. Spencer, P. M. Weidmann.

**Buffalo, N. Y.**—M & M Delivery & Garage Co., capital stock \$20,000; incorporators, G. Roughhead, R. MacDonald, Maud MacDonald.

**Detroit, Mich.**—F. Joseph Lamb Co., capital stock \$3,000; to manufacture motor car starters; incorporators, F. Joseph Lamb and John W. Fitzgerald.

**Mt. Clemens, Mich.**—Pallau Steel Co., capital stock \$75,000; to manufacture motor car springs; incorporators, A. T. Conaldson, A. J. Pallau, C. D. Jackson.

**Mt. Vernon, N. Y.**—Jacob Norden, Inc., capital stock \$10,000; to deal in auto supplies; incorporators, Max Jaeger, Jacob Norden, Sarah J. Norden.

**New York**—Anthony Bonofrio & Co., capital stock \$2,000; taxicab and garage business; incorporators, G. Bonofrio, A. Bonofrio, Jr., A. DeFio.

**New York**—Cyclecar Exposition Co., capital stock \$4,000; incorporators, J. T. McMahon, E. Astroff, J. Quittner.

**New York**—Equitable Garage, capital stock \$1,000; incorporators, H. Thal, Elizabeth Selnick, H. Selnick.

**New York**—Motor Gasket Co., capital stock \$10,000; to manufacture motor gaskets, auto accessories, etc.; incorporators, C. H. Loewenthal, P. H. Loewenthal, R. M. Loewenthal.

**New York**—Physicians' Automobile Co., Inc., capital stock \$70,000; incorporators, G. Maschke, M. Elkan, Harry Elkan.

**New York**—Steck Progress Oil Co., capital stock \$2,000; to deal in lubricating oils and greases; incorporators, H. L. Steck, S. C. Steck, R. Steck.

**New York**—William Woop Co., Inc., capital stock \$25,000; incorporators, F. Woop, M. A. O'Connell, G. M. Congdon.

**Nineveh, N. Y.**—Nineveh Coach & Car Co., capital stock \$15,000; incorporators, G. B. Raymond, Wm. A. Hyer, Frank L. Horton.

**Rockester, N. Y.**—Fox Taxicab Co., capital stock \$6,000; incorporators, J. T. Fox, Chas. F. Buehlte, P. Rothenbuescher.

preferred stock issue which was given the creditors last fall in exchange for their claims.

**New Rim On Market**—A company has just been formed in Boston to market the Presto demountable rim, and offices have been opened for it at 883 Boylston street. The rim is designed for such cars as the Ford and Maxwell machines.

**Truck Company to Extend Plant**—The Standard Motor Co., Warren, O., manufacturer of the Standard motor truck, has found present factory quarters insufficient and plans have been drawn and work will start soon on an addition which will cost \$15,000.

**More Dodge Appointments**—General Sales Manager A. I. Philp, of Dodge Bros., of Detroit, has made three new appointments of district representatives, John S. Collins, as representative for the Detroit district; H. D. Day, as Boston representative; and John A. Nichols, Jr., as representative for the Seattle district.

**Pittsburgh Section Formed**—To the seven local sections—New England, Chicago, Philadelphia, Washington, Cincinnati, San Francisco and Los Angeles—already existing, the Pittsburgh section of the Electric Vehicle Association was added recently. The Pittsburgh section has perfected its organization and has elected the following officers: W. A. Donkin, chairman; T. H. Schoepf, vice-chairman; J. A. Jaques, secretary.

**O. B. Henderson Resigns**—The Baker Motor Vehicle Co. of Cleveland announces the resignation of O. B. Henderson, sales manager of the pleasure car department, who on account of personal interests on the Pacific coast which demand his constant attention, has severed his connection with the company. Mr. Henderson leaves the latter part of this month to take up his permanent residence in Los Angeles.

**Hoosier Engineers Elect Officers**—The Indiana section of the Society of Automobile Engineers has elected Lon R. Smith, manager of the Indianapolis sales branch of the Elsemann Magneto Co., president. Grover Grimes, secretary and treasurer of the Central Prest-O-Ceal Co., has been elected secretary and treasurer of the section. The election took place at a meeting held at Crows Nest, the summer club house of the Hoosier Motor Club, near Indianapolis, on the evening of June 9.

**Enamel Plant for Buick**—The Buick Motor Co., of Flint, Mich., is still enlarging its plant. Now it is a new three-story enamel plant which is in course of construction, and which will be 108 by 265 feet. There will be fifteen ovens and two high-speed electric elevators of 4,000 pounds capacity. In addition to the standard equipment of the modern enameling plant there will be installed a monorail system for moving the raw material and the finished product to the various parts of the factory. The structure is to be completed by October 1.

**To Make Malcolm Cyclecar**—The Malcolm Cyclecar Co. has been formed to manufacture the Malcolm cyclecar in a large brick and concrete factory in Plymouth, Mich., 18 miles from Detroit. The new organization includes, as directors, Charles H. Bennett, vice-president and manager of the Daisy Mfg. Co.; B. B. Bennett, general manager of the Bennett Mfg. Co.; C. H. Lawrence, E. Malcolm Jones and C. A. Fisher, a Plymouth banker. E. Malcolm Jones will be retained as general manager of the new company,



# Brief Business Announcements



**Barberton, O.**—The Standard Motor Co. plans the erection of a garage and repair shop to cost \$15,000.

**Lima, O.**—Papers have been filed with the secretary of state increasing the capital stock of the Glenmore Lubricant Co. from \$17,500 to \$25,000.

**Milwaukee, Wis.**—The Gross Hardware Co., 126 Grand avenue, Milwaukee, has been appointed sole agent for the Braender tire throughout the state of Wisconsin.

**Columbus, O.**—A distributing branch for Mercer cars has been opened at 2364 Euclid avenue, Cleveland, by G. L. Sitgreaves, manager of the Mercer Sales Co., of Columbus.

**Detroit, Mich.**—The headquarters of the American Distributing Co., general sales agent for parts manufacturers, have been removed from Jackson, Mich., to the Gold-burg building, Woodward avenue, Detroit.

**Detroit, Mich.**—The Cadillac Automobile Painting and Trimming Co., located at present at 144 West Congress street, Detroit, has been incorporated, its capital stock now being \$50,000. A new plant, two stories high, 90 by 120 feet, is being erected at the corner of Oakland avenue and East Grand boule-

vard. R. A. O'Neill is president and general manager and Herbert J. O'Connor secretary and treasurer.

**Detroit, Mich.**—J. E. Spencer, of the Studebaker Corp., has been appointed assistant to First Vice-President A. R. Erskine of the Studebaker concern, with headquarters in Detroit.

**Oconto, Wis.**—Earl Wright will open a garage at Oconto, as soon as a fireproof building now being constructed for this purpose is completed. The structure is 46 by 80 feet in size and two stories high. Agency lines have not been settled upon.

**Detroit, Mich.**—Louis C. Miller, formerly with the Carl H. Page Co., in New York, and the Chalmers Motor Co., of Detroit, has gone into business at 291 Twelfth street, Detroit, and will make a specialty of remodeling old cars and of special body work.

**New Haven, Conn.**—J. W. Gogarn, for 10 years advertising manager for R. M. Owen & Co., formerly general selling agents for the Reo, has become sales and advertising manager for N. B. Whitfield, agent for the Overland, Apperson and Premier. In addition to directing the sales and advertising for

Mr. Whitfield during the ensuing year, Mr. Gogarn will act as general distributor for Ajax tires and accessories in this city.

**Lansing, Mich.**—Louis B. and Lucy G. Saunders and S. H. Simmons, have organized the Division Avenue garage, the capital stock being \$1,000.

**Buffalo, N. Y.**—The George W. Houk Co. of Buffalo, N. Y., announces the appointment of H. M. Kiesewetter, formerly of the Michelin Tire Co., as advertising manager and manager of its New York branch.

**Milwaukee, Wis.**—The Calumet garage, 1824-1826 Fond du Lac avenue, Milwaukee, owned by William E. Steinert, collapsed as the result of building excavations made on the adjoining lot, on June 18. The loss is about \$6,000. The building will be reconstructed at once.

**Minneapolis, Minn.**—The Regal Motor Co. has been organized and succeeds to the place of business of the Regal Sales Co., at 1400 Hennepin avenue. Former Regal people have formed the J. P. McGuire Co., which will carry the Partin-Palmer, handled by the Regal Sales Co., and will have its place of business at 1406 Hennepin avenue. The Regal Motor Co. is capitalized at \$25,000.

## Recent Agencies Appointed by Motor Car Manufacturers

### PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
Arthur, N. D.	Arthur Mercantile Co.	Maxwell	Ely, Nev.	Mr. Leak	Chandler
Atwood, Kan.	Youngblood Auto Repair Co.	Maxwell	Eldon, Ia.	Flint & Knight	King
Alma, Kan.	G. A. Mueller	Maxwell	Elkhart, Ia.	J. M. Fredericks	King
Arcadia, Fla.	S. J. Simmons	Chandler	Elizabethtown, Ky.	J. Hayden Igleheart	Hupmobile
Alexandria, O.	S. S. Anderson	Empire	Ft. Collins, Colo.	Howard E. Smith	Maxwell
Alexandria, La.	W. Lennie Smith	Koehler	Paola, Kan.	Lehr & Gardner	Maxwell
Belvidere, Ill.	J. W. Fox & Son	Maxwell	Fitchburg, Mass.	Fitchburg Hardware Co.	King
Bridger, Mont.	W. E. Pinkney	Hercules	Forest City, Ill.	J. H. White	Maxwell
Bowling Green, Ky.	Imperial Auto Co.	Studebaker	Fort Wayne, Ind.	H. G. Raymond & Co.	Chandler
Bowling Green, Ky.	Imperial Auto Co.	Hupmobile	Fulton, Ala.	J. A. Furr	King
Boston, Mass.	F. H. Gross	Lyons-Knight	Ft. Dodge, Ia.	L. N. Ashford	King
Burlington, Colo.	Scofield & Hoskin	Maxwell	Fenton, Ia.	Stighman & Langeman	King
Barnard, Kan.	H. J. Hibler	Maxwell	Flemingsburg, Ky.	Dudley Garage	Ford
Burlington, Kan.	Z. T. Grant & Son	Maxwell	Franklin Grove, Ill.	W. L. Sheap	Haynes
Bridgeport, Ill.	W. B. Gray & Son	Chandler	Farmersburg, Ind.	W. D. Bolinger Co.	Maxwell
Bracken, Tex.	Charles Rimshagen	Chandler	Glencoe, Ky.	C. P. Beatty	Maxwell
Beardstown, Ill.	John E. Parks	Chandler	Gananoque, Ont.	W. J. Gibson	Maxwell
Birmingham, Ala.	Birmingham Garage	Chandler	Guernsey, Wyo.	W. L. Diver	Maxwell
Bridgewater, Mass.	Bridgewater Inn Garage	Koehler	Greenville, Pa.	J. Burnett Quinton	Chandler
Birmingham, Ia.	Chas. Glatfelter	King	Gary, Ind.	John A. Breenon	Chandler
Battle Creek, Mich.	Harry Riggs	Paige-Detroit	Gradyville, Ga.	Dr. W. H. Bryan	King
Barbourville, Ky.	Walter Barner	Krit	Glidden, Ia.	E. O. Potter	King
Brookville, Miss.	Madison Hambrick Auto. Co.	Maxwell	Green Bay, Wis.	Conley-Judd Motor Co.	Haynes
Burwell, Neb.	G. R. Key	Maxwell	Glasgow, Ky.	Bradford Brothers	Ford
Baltimore, Md.	Shaffer Mfg. Co.	King	Holbrook, Ariz.	Chas. L. Rhoton	Maxwell
Brockton, Mass.	Morton McGrillis	King	Harrison, Ark.	Frew Saddlery Co.	Maxwell
Corsicana, Tex.	A. R. & M. J. Lewis	Maxwell	Hiawatha, Kan.	G. C. Willis	Chandler
Cleveland, O.	Hudson Motor Sales Co.	Hudson	Hattiesburg, Miss.	Hunter's Auto Repair Works	Maxwell
Chattanooga, Tenn.	Wallace Buggy Co.	Overland	Hazleton, Pa.	G. W. Wilmot	Chandler
Chattanooga, Tenn.	The Bill Jones Auto Co.	Hudson	Humboldt, Ia.	E. Bauman	King
Clare, Mich.	A. Roe	Maxwell	Hopkinsville, Ky.	Ideal Motor Co.	Ford
Cone, Mich.	F. B. Raymond	Maxwell	Jewell, Kan.	C. E. Ohlinger	Maxwell
Canton, Kan.	N. G. Alldritt	Maxwell	Jackson, Tenn.	Wm. Glenn, Jr.	Chandler
Cheriton, Va.	R. A. Wise	Chandler	Jolley, Ia.	E. C. Clark	King
Cullman, Ala.	John F. Sutterer	King	Jesup, Ia.	Miller Bros.	King
Corydon, Ia.	Wayne Auto Co.	King	Kirkman, Ia.	Edgar Larson	Maxwell
Cedar Rapids, Ia.	A. M. Reynolds	King	Kutztown, Pa.	J. R. Augstadt	Chandler
Charles City, Ia.	Riley & Russell	King	Kiowa, Kans.	Benton & Ives	Maxwell
Columbus, O.	Brasher Motor Car Co.	Vim	Knosburg Falls, Vt.	E. A. Beatty	King
Coffeyville, Kan.	Franklin Motor Car Co.	Franklin	Knoxville, Tenn.	Cadillac Sales Co.	Cadillac
Chilhowee, Mo.	Strawburg & Bugard	Maxwell	Las Animas, Colo.	T. H. Marshall	Maxwell
Clarkshill, Ind.	McKinney & Mugg Auto. Co.	Maxwell	Long Beach, Cal.	J. S. White & H. W. Judson	Maxwell
Columbus, Miss.	T. W. Townsend	Maxwell	London, Ont.	Central Garage Co.	Chandler
Camden, Me.	Guy Ware	King	Laurens, Ia.	Johnson Imp. Co.	King
Circleville, O.	I. P. Todd	Little Giant	Ladora, Ia.	York & Tyler	King
Dothan, Ala.	W. L. Brown	Koehler	Lebanon, Ky.	Ivo L. Canary	Hupmobile
Elizabeth City, N. C.	Oliver E. Lane	Maxwell	Lima, O.	Lima Garage	Maxwell



Incorporators are R. C. and I. E. Smith and J. Costella.

**Columbus, O.**—The Red Letter Tire Co. is the name of a new concern located at 20 East Town street, Columbus, under the management of Leo Sulzer. The concern will be distributor for the Acme Tire Co.

**Detroit, Mich.**—The Cricket Cyclecar Co., which has its plant at Walker and Woodbridge streets, Detroit, has recently arranged with W. G. Sanders & Son, 762 Woodward avenue, to be Michigan state distributor.

**Detroit, Mich.**—Robert Wilde and Arthur P. Emmett will organize the Michigan Gear and Engineering Co., in this city, for the purpose of making gear-cutting machines and tools, cutting gears, and acting as consulting gear engineers.

**Vancouver, B. C.**—T. Hamilton, formerly of Lewthwaite & Hamilton, has formed a partnership with M. H. Slater and together they have opened a repair shop at 757 Beatty street.

**Detroit, Mich.**—A new garage, to be known as the Down Town garage, will open for business at 80 Congress West, Detroit, about July 15. It is located in the heart of the business district.

**Lima, O.**—The Gramm-Bernstein Co., manufacturer of motor trucks, is planning the building of several additions to the present plant. A building will be erected at once for the painting and assembling de-

partments. This structure will be 48 by 110 feet and will be of steel and concrete construction.

**Philadelphia, Pa.**—F. E. Rice has resumed his position of sales and advertising manager of the Atwater Kent Mfg. Works after a winter's sojourn in the west.

**Columbus, O.**—Carl Crawford has opened a general repair shop for bodies and tops at 534 Parsons avenue, Columbus. He does general motor car blacksmithing.

**Milwaukee, Wis.**—The Jesse A. Smith Auto Co., 213-215 Wisconsin street, Milwaukee, Wis., has been appointed distributor for Wisconsin and the upper peninsula of Michigan for the Hudson.

**Columbus, O.**—The Seventeenth Street garage, located at 96 North Seventeenth street, has been purchased by J. R. Jones and is now being operated under the name of the Columbus Auto Service Station.

**Milwaukee, Wis.**—Thomas O. Harvey, 524 Mason street, Milwaukee, has organized the Thomas Harvey Oil Co., with \$50,000 capital stock, to engage in the manufacture, refining and sale of petroleum products, etc. H. D. Daniels is associated with him.

**Detroit, Mich.**—Thomas Brooks, who already owns two garages, one at 2674 and the other one at 2711 Woodward avenue, Detroit, has become the owner of the Highland Park garage, formerly operated by W. S. McEvoy. The name will be changed to "Brooks—The

Automobile Exchange." It is the intention of Mr. Brooks to secure some more garages.

**Detroit, Mich.**—Clarence N. Booth, formerly general manager of the Studebaker Corp., is not with the Universal Motor Truck Co., of Detroit.

**Detroit, Mich.**—Louis E. Wagner has become associated with the Century Electric Co., of Detroit. He will direct his efforts in building up the efficiency of the sales and service branches in the national field and will organize a department for assisting dealers.

**Detroit, Mich.**—E. W. Brown and C. Rasmussen have organized the Safety Tire Co., with quarters at 953 Woodward avenue, Detroit. Supplies and accessories will be handled, but tire repairing will be the feature part of the business.

**Minneapolis, Minn.**—The Lyndale Garage Co. has been formed by the following: Courtland E. Bullock and Harold M. Lewis of Minneapolis and E. C. Miller of Lydia, Minn., with \$25,000 capital. They have taken a garage at 800 Lyndale avenue. The company will take a car agency later.

**Plymouth, Wis.**—The Maxwell Co., Plymouth, Wis., a large furniture manufacturing concern, which several months ago turned its attention to the production of hearse, ambulance and other special bodies for motor cars, filed a voluntary petition in bankruptcy at Milwaukee last week. Assets are given as \$35,196 and liabilities as \$19,565.

## Recent Agencies Appointed by Motor Car Manufacturers—Continued

### PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
Lexington, Pa.	E. F. Cox	Moon	Richfield, Ill.	G. E. Brubaker	Chandler
Lowell, Mass.	A. P. Sackley	King	Reedsburg, Wis.	Townsend & Kinney Co.	Overland
Lorain, O.	G. W. Williams	Overland	Reedsburg, Wis.	Townsend & Kinney Co.	Studebaker
Minneapolis, Minn.	Choate Auto Co.	R-C-H	Reedsburg, Wis.	Townsend & Kinney Co.	Buick
Meade, Kan.	Meade Motor Co.	Maxwell	Reedsburg, Wis.	Townsend & Kinney Co.	Jeffery
Murray, Utah.	E. Carlson	Chandler	Reedsburg, Wis.	Townsend & Kinney Co.	Ford
Mt. Pleasant, Mich.	A. C. Campbell	King	Radcliffe, Ia.	Mason & Butler Co.	King
Malcom, Ia.	Malcom Garage Co.	King	San Francisco, Cal.	Christensen Motor Car Co.	Monarch
Mt. Ayr, Ia.	Samuel F. Kater & Sons	King	Stewartville, Minn.	F. L. Hodgson	Maxwell
Mt. Vernon, O.	C. E. Burkepyle	Car-Nation	St. Charles, Mo.	St. Charles Garage	Maxwell
Manitowoc, Wis.	Marcus J. Rappel	Haynes	Seneca, Kan.	J. J. Buser Auto Co.	Maxwell
Merrill, Wis.	Norman Chilsen	Haynes	St. John Kan.	St. John Auto Co.	Maxwell
Milwaukee, Wis.	Jesse A. Smith Auto Co.	Hudson	Simpsonville, Ky.	L. G. Baskett	Maxwell
Milbank, S. D.	R. A. Berkner	Maxwell	San Bernardino, Cal.	Firth Crossland	Maxwell
Mart, Tex.	W. L. Lowry	Maxwell	Springfield, Ill.	Van Buyn & Mathys	Chandler
Mt. Pleasant, Mich.	A. Z. Campbell	King	Scranton, Pa.	Bishop Brothers	Chandler
Minneapolis, Minn.	Minndakota Cycle Co.	Dart	State Center, Ia.	Edward Eckhardt	King
Medicine Lodge, Kans.	W. S. Benefield Hardware Co.	Maxwell	Sexton, Ia.	Edwin Johnson	King
Maysville, Ky.	Central Garage Co.	Ford	Sarnia, Ont.	Hitchcock & Richardson	Franklin
Maysville, Ky.	Kirk Bros.	Hupmobile	Shelbyville, Ill.	M. O. Finks	Maxwell
Medicine Hat, Alta.	Diehl Motor Car Co.	Franklin	Sunbury, Pa.	H. O. Bateman & Co.	Franklin
Narka, Kan.	Holechek Brothers	Maxwell	Springfield, Mass.	Ross Motor Car Co.	Moon
Nevada, Ia.	Nevada Auto Co.	King	Tupelo, Miss.	Tupelo Implement Co.	Maxwell
New Philadelphia, O.	Herbert Urfer	Lewis	Tarkio, Mo.	Tarkio Auto Co.	Maxwell
North Jay, Me.	A. R. & E. N. Kyes	Maxwell	Verona, Ill.	John F. Stitt	Franklin
New Bedford, Mass.	E. L. Waybrant	Koehler	White Plains, N. Y.	Bernard Hopp, Jr.	King
Ozama, Tex.	S. E. Couch	Chandler	Winfield, Kan.	A. E. Hudson	King
Oxford, Mass.	E. A. Wheelock	King	Wapakoneta, O.	W. G. Taylor	King
Providence, R. I.	Elmwood Garage Co.	Lyons-Knight	Walbridge, O.	F. J. Schriber	Saxon
Port Richmond, N. Y.	I. A. Silvie, Jr.	Maxwell	Worcester, Mass.	Maynard Rubber Co.	King
Paisley, Ore.	J. P. Cruzan	Maxwell	Worcester, Mass.	Worcester Auto. Co.	Maxwell
Perthshire, Miss.	S. D. Knowlton	Chandler	Winchester, Ky.	W. Gardner Redmon	National
Plainfield, N. J.	E. & C. Auto Co.	Chandler	Williamsburg, Ia.	H. A. Dunlap	King
Portland, Ark.	Bain-Adams Co.	Chandler	West Union, Ia.	Edwin G. Erler	King
Pinconning, Mich.	Lawrence & Naumes	King	Wichita Falls, Tex.	Brown & Ellinger	Chandler
Polk, Ia.	C. A. Snow	King	Westfield, N. J.	H. L. Fink	Chandler
Pontiac, Ill.	J. P. Cook & Co.	Haynes	Waverley, Va.	V. C. Johnson	Chandler
Paris, Tenn.	D. L. Burton	Maxwell	Wichita, Kan.	Raffety & Rodda	Maxwell
Port Jervis, N. Y.	Rutan Auto. Co.	Maxwell	Wilson, Kan.	Weber & Co.	Maxwell
Providence, R. I.	Nelson A. Davis	Locomobile	Millington, Mich.	D. J. Evans	Maxwell
Rolette, N. D.	I. S. Berg & Brother	Maxwell	West Newton, Pa.	Adams & Robinson	Maxwell
Rocky Mount, N. C.	B. H. Johnson	Maxwell	Waynesville, Ill.	James & E. L. Dagley	Maxwell
Racine, Wis.	Spencer Hall	Maxwell	Meridian, Miss.	Payne & Stevens	Maxwell

### COMMERCIAL CARS

Bowling Green, Ky. Imperial Auto Co. Koehler  
 Ft. Benton, Mont. McGinley & Allen. Hercules  
 Louisville, Ky. Strube's Garage. Koehler

Minneapolis, Minn. Motor Truck Sales Co. Vim  
 Milwaukee, Wis. Ralph Temple Auto Co. Selden  
 Red Lodge, Mont. Edward Olcott. Hercules



# The Motor Car Repair Shop



## Frosting Electric Bulbs

**T**HE direct light from clear bulbs as used in repair shops is annoying when a man must work by that light for a considerable period, and as a suggested remedy the bulbs should be frosted. Frosting of the bulbs subdues the light sufficiently to allow the repairman to work under it for a long while without becoming dizzy when the eyes are lifted. Aside from being valuable as a means of subduing the light of bulbs in the garage and repairshop, the frosting may be used for headlight bulbs as types of this sort have been accepted by headlight committees in various cities. A very satisfactory solution for frosting bulbs is made by mixing the following substances: Sandarac 2 ounces, mastic  $\frac{1}{2}$  ounce, ether 23 ounces and benzine 15 ounces. The mastic and sandarac should be ground together and then mixed with the solution of ether and benzine. After the solution has been prepared it should be placed in a deep bowl large enough to accommodate a bulb. The latter is immersed in the solution and the extent of the frosting will depend largely upon the number of times the bulb is immersed. The second coating should not be applied until the first has dried thoroughly.

## Care of Leather Tops

Leather tops often become spotted due to the fact that rain water has not been brushed off with a cloth. Usually the water is allowed to evaporate, but the inevitable result is a number of unsightly spots. These, and spots due to other causes, may be removed by using spirits of sal ammoniac as the cleanser. A little of the spirits should be allowed to remain on the spotted portion of the top for a few minutes and then rubbed off. The top should then be washed with clean water and dried with a cloth. This method usually is successful.

In snowy weather the best method of preserving the top is by the use of castor oil. If applied but once a month it not only keeps the top waterproof but preserves the leather. The oil should be applied with a soft rag and rubbed in. A former practice and a poor one was to use linseed oil, but this has been found to rot the leather instead of preserve it.

## Graphite in Lubricants

Graphite used as a lubricant in connection with some other lubricant is better than oil or grease alone, it is stated. It has been found, especially in the lubrication of ball bearings, that if graphite be mixed with the grease better results will be obtained than if grease alone were used. The market already offers some preparations based upon the practicability of this theory and not only are these prepa-

## Method of Frosting Bulbs

arations to be used in connection with bearing lubrication, but with cylinder lubrication as well. For the transmission a mixture of one-third graphite, one-third grease and one-third transmission oil will be found to be much more satisfactory than the use of oil alone, it is claimed. It has been found by experiment that combining the graphite with the ordinary lubricant increases the viscosity and flashing point, two factors desired of a good lubricant.

## Case Hardening

Very often the repairman complains that his wrenches and hammer heads are getting soft. The wrench, instead of gripping the nut firmly, slips around and the hammer head becomes dented more and more with use. This rapid wearing can very easily be remedied if such tools are case hardened properly. Wrenches especially, lose their hardness after being used for some time and to retain the proper dimensions these tools should be hardened. Case hardening, as the expression implies, means a hard case or coat being added to the metal. This is accomplished in the following way: The wrench or other tool that is to be case hardened is allowed to remain in the forge until red hot, then quickly taken out and sprinkled with potassium cyanide and then allowed to cool slowly. The elements contained in the potassium cyanide combines with the metal of the tool and form a compound which is much harder than the tool metal itself. Of course there are materials that may be used for case hardening other than potassium cyanide, such as charcoal mixed with barium carbonate or ground charcoal alone. These various compounds may be bought cheaply at any drug shop.

The reason these different tools are case hardened is because they must necessarily

withstand shock coupled with abrasion, the outer coat or case protecting the inner metal, the latter acting as a cushion. Gears, for example, in hitting against one another, would crack if they were hardened through, but when case hardened, the outer casing of hard metal takes up the wear and the inner soft metal gives the necessary cushioning effect.

## White Lead for Connections

A leaky water connection can be very readily repaired in the majority of cases by simply loosening the connection, applying a generous coat to surfaces of the flanges, the gaskets or to the male portion of the joint, and then securing the connection again and leaving it stand for a few hours to give the white lead a chance to set.

A leaky water connection is a very annoying condition; it makes necessary the replenishing of the water supply of the radiator at frequent intervals if overheating is to be avoided; the rust markings of the leaking water gives the motor an untidy appearance, and if the required replenishing of the water supply is not carefully attended to considerable damage can be done the internal mechanism of the motor as a result of the overheating.

The motorist or repairman who finds difficulty in fitting a new piece of hose to the male metal portion of a radiator or water manifold can greatly facilitate the operation by use of white lead as above mentioned. The white lead is oily and permits the rubber inner lining of the hose to slip onto the metal connection very easily, thus preventing it from being skinned or scraped from the fabric and clogging up the entrance to the metal connection. The oil in the white lead has a slight disintegrating effect upon the rubber, that keeps the rubber and the white lead in a comparatively soft condition. This insures a water-tight joint, keeps the rubber from cracking, and makes it easy to disconnect the rubber hose.

## A Simple Cleaning Device

A very simple device for cleaning parts, and one which utilizes kerosene, or gasoline, is shown in Fig. 1. It consists of two copper tubes about  $\frac{1}{4}$ -inch diameter and soldered together at a convenient point. Rubber tubing is attached to the ends and one tube dropped into a can half filled with kerosene while the other is attached to an air-compressor or tank.

By forcing air through the one pipe kerosene is drawn through the other and the mixture of the two sprayed at the end, as shown in the illustration herewith. This spray leaving the tube under pressure is a very good dirt remover and it is especially desirable for cleaning parts installed in the car.

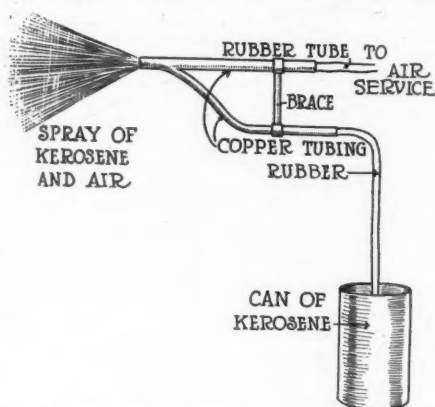


FIG. 1—A SIMPLE DEVICE FOR CLEANING

When air is forced into one of the tubes kerosene or other cleaning liquid is drawn through the other and a spray of air and coal oil is sent from the end of the cleaner



# Studebaker

The Studebaker SIX and the Studebaker FOUR are the most completely manufactured motor cars made.

That is one reason why Studebaker dealers have a distinct sales advantage over every other competing dealer.

The ease, the long life, the balance, the roadability of a motor car are all in direct relation to the proportion of closely manufactured parts produced by the maker of the car.

And Studebaker manufactures a greater proportion of its own parts than any other motor car manufacturer in the world.

## Studebaker

Detroit

F. O. B. Detroit

FOUR Touring Car.....\$1050	SIX Touring Car.....\$1575
FOUR Delivery Car.....\$1150	SIX Landau Roadster.....\$1800
SIX Sedan.....\$2250	



Studebaker "FOUR"  
\$1050.



**It does not take space  
or words to sell an  
article of merit to a  
man of brains.**

**WHEELER & SCHEBLER  
INDIANAPOLIS**



## The Egerton Standard

147

Perhaps it was the challenge of that curiosity that struck a spark from the crumbling substance of Germain's resolution. He fired three times in rapid succession.

The first two shots took effect, the last went wide, as Egerton started to his feet, then fell back into the cushioned seat.

"I did n't think you had it in you, Germain!" he panted, raising his left hand to the crimson spot that sprang into view against his shoulder. His right arm hung at his side, a red line staining the sleeve.

Germain made no answer, staring with lowered head at the man before him, while shaken by a succession of nervous tremors. There was not remorse in his expression, nor triumph; merely stunned consternation.

"I will give you another chance," Egerton offered presently. "Drive me to the nearest place where there is a surgeon, and I will make no charge against you. Here"—he put his fingers into a pocket—"I will add to that enough money to enable you to get away from the neighborhood. Unless"—as the other did not speak—"you mean to finish me."

A strong shudder ran over the youth. Suddenly dropping the pistol, he turned and fled, crashing through the light undergrowth and striking against trees and bushes in his frenzy of haste to escape.

Abandoned, Egerton lay still for a few moments, then aroused himself and put his finger on the button of the car's electric horn. A long, raucous wail shattered the forest hush. Two miles the sound would carry, according to the signal's manufacturers. Here, on the heights of the Palisades, that might be necessary.

Approaching steps through the woods first suggested the danger that Germain, alarmed by the horn, might return to silence the signal and the signaller. Egerton drew himself erect in the seat, his finger still pressing the button.

"Perhaps you might shut off your klaxon," spoke a voice behind him; a voice singularly agreeable in its cool freshness and youth. "If you are calling for help, I am all there is likely to be."

Egerton turned eagerly, and encountered the meditative dark eyes of a slight, chestnut-haired, rather shabby young man who stood in the road.

"I have been shot," Egerton explained concisely. "Can you drive the machine to some place where I can find a surgeon?"

"Shot?" The dark eyes lightened, appraising him. "I should say so! You need the surgeon before the drive."

"I know that. Can you—"

"I'm not qualified, but I've seen some such work done. We will have to try it."

As he spoke, the young man slipped off his coat and rolled back his sleeves with a delightful readiness and cordiality altogether surprising to the colder Egerton. It was a friend, not a passer-by, who swung

*The road for "Warning Signal"*

# A Plain Talk About Chalmers Policy

## To Motorists Everywhere:

You who read *Motor Age* regularly see a great many page and double-page automobile advertisements.

Many of these automobile advertisements read much alike.

The reason for this is the similarity in many respects between some of the most favorably known and most widely sold cars.

## Chalmers Cars Are Different

Now Chalmers cars—the "Light Six" at \$1800; the "Master Six" at \$2175—are different from others because they are distinctively Chalmers—because they are built by Chalmers men in the Chalmers shops.

And we want to make this a different kind of an automobile advertisement if we can. We will leave out such words as "best," "greatest," "finest," "lightest," and so forth, and try to give you some definite idea of what there is about Chalmers cars that makes them different from others.

We will begin by making this statement, which you have never before read in any automobile advertisement:

*We have never lost a sale to a prospective buyer who has seen the Chalmers "Sixes" being made in the Chalmers factory.*

This tells you, first of all, that Chalmers cars are built complete in the Chalmers plant. No "assembling" company could make a statement of this kind, because to see an assembled car being manufactured, one would have to visit many cities and many factories.

Our statement tells you next that Chalmers quality is a definite thing which can be readily appreciated once you have seen the Chalmers methods of manufacture, and the materials which go into Chalmers cars.

Undoubtedly those who visit the different automobile factories before buying a car have an advantage over those who cannot. We will try, therefore, to tell you in detail what it is that makes those who visit the Chalmers factory buy Chalmers cars.

## Chalmers Quality In-built

Probably the first thing that would impress you in the Chalmers plant is the fact that quality is something that must

be "built in" an automobile. You would see that this quality means painstaking workmanship by skilled mechanics; rigid inspection; up-to-date machinery, and high grade materials.

In the Chalmers factory you would be impressed with the fact that Chalmers cars must be of high quality to protect the Chalmers investment. The Chalmers Company is in business to stay. You would see 30 acres covered with big, permanent buildings, which have more than a million square feet of floor space. These buildings and land are owned free from encumbrance by the Chalmers Company.

Nearly 4,000 trained employees work in Chalmers shops.

As you walked through the Chalmers plant you would see that every important part that goes into a Chalmers car is built in the Chalmers works.

## Public Will Decide

Just now there is considerable discussion on the subject of automobile weight. You may remember that there was some discussion about power a few years ago.

The public settled the question of horsepower—as it will eventually settle the question of weight.

Buyers did not want extreme high power. They did not want extreme low power—they wanted medium power.

In the same way the public will ultimately decide that overweight means excessive upkeep. The public will also decide that underweight means lack of strength and easy riding qualities.

It costs money to pull useless weight, but it costs more money to repair broken parts whose strength has been sacrificed in the rush to get aboard the light car "band-wagon."

The people who buy Chalmers cars are settling the weight question now. They are settling it ahead of others in the way that it will be eventually settled—by purchasing medium weight cars.

In Chalmers cars there is no skimping at expense of safety and strength.

All parts that should be big and strong are made big and strong. We save on weight where weight is not needed for safety.

And no lighter car than the Chalmers uses better materials. We use as good materials as money can buy, and we don't overweight any part of our car because we don't like to spend money uselessly for materials any more than you would like to have us.

It is only because the Chalmers Company is satisfied with a small profit per car that we are able to build such values into our product at Chalmers prices. Our profit on the \$1800 "Light Six" is less than \$100 per car. And you pay one profit only when you buy a Chalmers. For we build our own parts—do not purchase them outside.

We know of no other company marketing cars of the Chalmers price, and quality that takes as small a profit.

## We Are in Business to Stay

As we have often stated in Chalmers advertisements, we are in business to stay. We are not trying to get rich in a hurry. We believe that by building quality into Chalmers cars, by giving the utmost for the money and by being content with a small profit per car, but with a big production, we have found the surest way to maintain a big and permanent volume of business.

We know that quality counts. So we believe it will be even easier to sell Chalmers cars in two or three years than now. We are building for the future—and so we build quality first. Price comes afterward.

If you are considering a car below the Chalmers price don't let \$100 to \$300 stand in the way of your getting a real quality car easily worth many times the extra cost in value and service.

We would not reduce the quality of Chalmers cars to meet "price." It may be necessary to raise the prices of our cars later in the season. We shall certainly not lower the quality.

## Chalmers Dealers Now Delivering 1915 Models

If you will visit the nearest Chalmers dealer, he will show you more ways in which Chalmers cars differ from others. He will be glad to give you a searching demonstration of the \$1800 Chalmers "Light Six," or the \$2175 Chalmers "Master Six," that will be a revelation to you.

1915 Chalmers "Light Six" Touring Car. \$1800  
1915 Chalmers "Light Six" Coupelet. . . . 2050



Chalmers "Master Six" 5-passenger. . . . \$2175  
Chalmers "Master Six" 6-passenger. . . . 2275

*Quality First*

# Chalmers Motor Company, Detroit

*When Writing to Advertisers, Please Mention Motor Age.*





WHERE



**STORAGE  
BATTERIES  
AND  
BATTERY  
SERVICE  
MAY BE  
OBTAINED IN  
DETROIT**

**Factory Branch at  
736-740 Woodward Ave.**

These photographs furnish but a faint idea of our facilities for affording service to manufacturers and **LBA** users in Detroit.

FOUR OTHER FACTORY-OPERATED BRANCHES carry complete stocks of batteries and parts and maintain ample charging and repair service.

OVER 200 SERVICE STATIONS in the United States and Canada insure the utmost satisfaction to users of **LBA** Storage Batteries everywhere.

**LBA WILLARD STORAGE BATTERY CO. LBA**  
CLEVELAND, OHIO

New York Branch: 136 W. 52d St.  
Chicago Branch: 2241 Michigan Ave.

Detroit Branch: 736-740 Woodward Ave.  
San Francisco Branch: 821 Monadnock Bldg.  
Indianapolis Branch: 318 No. Illinois Ave.

SERVICE STATIONS IN ALL PRINCIPAL CITIES IN THE UNITED STATES, CANADA AND MEXICO

**CHARGING  
ROOM  
DETROIT  
BRANCH**

**46  
CHARGING  
STATIONS**

afford facilities for  
charging over 1000  
Starting and Lighting  
Batteries at a time.

**10,000  
Batteries Carried  
in Stock  
at This Branch**



(104)

When Writing to Advertisers, Please Mention Motor Age.

# \$1595 CHANDLER

LIGHT-WEIGHT SIX For 1915

## Dealers From All Over the Country Are

**S**INCE our announcement two weeks ago of the Chandler for 1915 at \$1595, dealers have flocked to Cleveland for Chandler agencies.

And every one of the many dealers who sold the Chandler last year is demanding renewal of contract.

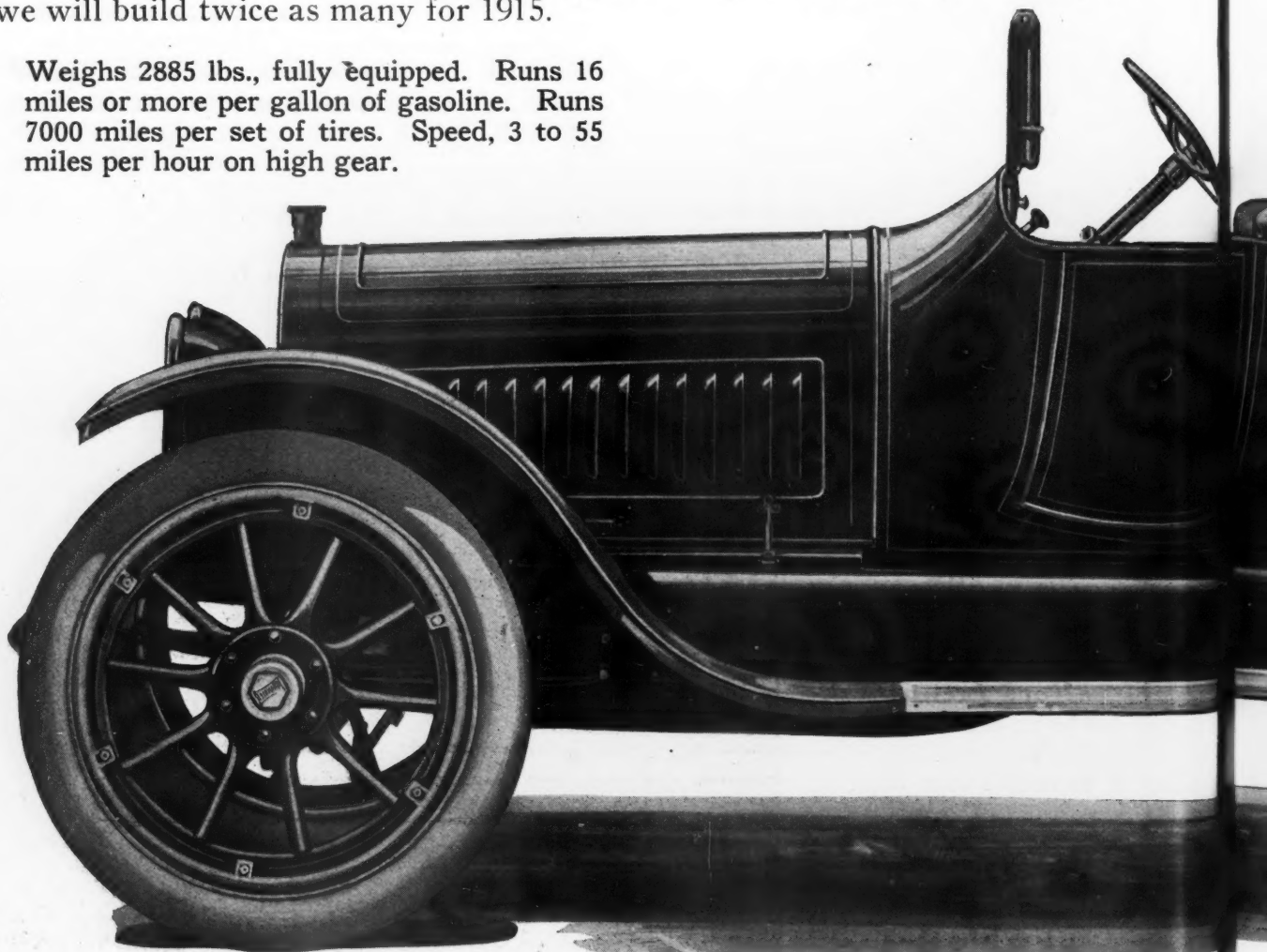
THE CHANDLER—pioneer of light-weight sixes—has proved its genuine leadership.

We have doubled our production for 1915.

The public has given its verdict. It wants more CHANDLERS.

The trade has given its verdict. It knows the Chandler is a ready seller. It knows that for \$1595 it is far-and-away the biggest six-cylinder value on the market. So we will build twice as many for 1915.

Weights 2885 lbs., fully equipped. Runs 16 miles or more per gallon of gasoline. Runs 7000 miles per set of tires. Speed, 3 to 55 miles per hour on high gear.



**Chandler Motor Car Co., 206-236 East 131st St., Cleveland, Ohio**

*When Writing to Advertisers, Please Mention Motor Age.*



# CHANDLER \$1595

LIGHT-WEIGHT  
SIX For 1915

## Storming Cleveland for Chandler Agencies

The handsome design, the workmanship, the economical light-weight and the exclusive marvelous motor of this splendid six have achieved widest recognition.

There is nothing cut out of the Chandler for 1915. It is even better than last year's model. No radical changes, but refinements throughout and 10% more power.

We are making deliveries of the 1915 Chandler touring car and roadster. Shipping more cars now than ever before.

Remember the motor that has made this car famous is the exclusive Chandler motor, not a stock motor found on a dozen makes.

**WIRE, WRITE OR COME TO CLEVELAND AT ONCE.  
YOUR TERRITORY MAY BE OPEN**



**Chandler Motor Car Co., 206-236 East 131st St., Cleveland, Ohio**

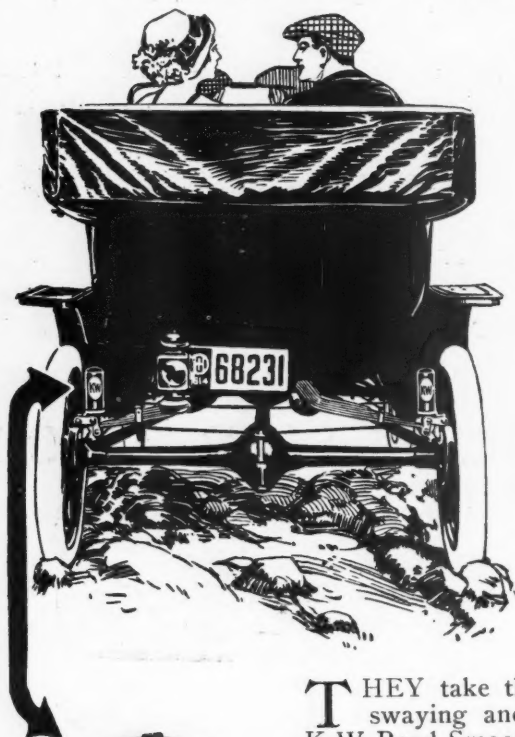
*When Writing to Advertisers, Please Mention Motor Age.*

HIGH *and*  
LOW TENSION  
MAGNETOS



MASTER VIBRATORS  
ROAD SMOOTHERS  
AUTO LOCKS

# Make Every Road a Lincoln Highway



Don't wait for good roads. Make them. Get big, heavy car comfort from your light, economical Ford by Smoothing out the Rough Roads with



## ROAD SMOOTHERS

Reg. U. S. Pat. Off.

Quickly Applied to your Ford Car

THEY take the roughness out of the road and eliminate the pitching, swaying and vibration that racks and shortens the life of your car. K-W Road Smoothers seem to level off the high places and fill up the low places. Wherever you ride the bumps and jolts are gone—*ironed out* by the K-W Road Smoothers. They save tire and gasoline bills and add greatly to your safety and the life of your car.

The "anti-rebound air chamber" prevents the rebound of the spring. It is an essential feature and found ONLY in the K-W Road Smoothers.

The "anti-side-motion links" of the K-W Road Smoothers prevent side rocking and swaying when turning corners, and greatly reduce any tendency to skid.

There are no wearing parts or friction surfaces, consequently no oiling or packing in grease is necessary. No attention required after installation.

### K-W Quality Throughout

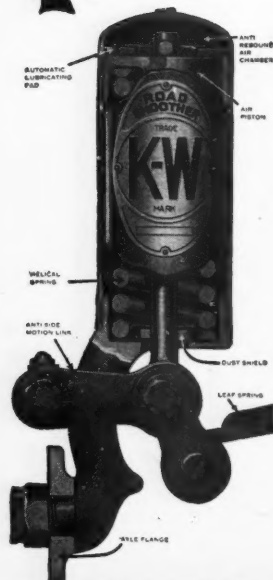
K-W Road Smoothers are built of the very best materials obtainable. We use no cheap castings but instead, high-grade, heat-treated drop forgings. Our springs are made of electric smelted chrome, Vanadium steel—the most expensive spring steel that money will buy. They will not bend—they will not break—they will not lose their easy riding qualities because K-W quality is built into them all the way through. Phosphor bronze bushings are used throughout.

**\$25 SET OF FOUR  
ONE FOR EACH WHEEL**

The principle is right—the design is right—the workmanship is right—and the price is right.

K-W Road Smoothers are sold by reliable dealers everywhere. If your dealer cannot supply you, we will send

a set direct to you on receipt of price. Don't confuse these with ordinary shock absorbers. Write for free booklet—"Taking out the Bumps." We will gladly send it on request.



HEADLIGHTING  
OUTFITS

THE **K-W** IGNITION CO.  
2835 CHESTER AVE. CLEVELAND, OHIO, U.S.A.

SPARK COILS  
SPARK PLUGS



# A Voyage of Discovery

**I**N THIS broad country there are many cities and towns—some are busy, some are quiet—and some neither quiet nor busy—just plain home-made towns.

In these towns there are men who buy automobiles—some are busy some are quiet—some have gone fishing. Just plain every day chaps.

In these towns there are also automobile dealers—some are busy—some are quiet—some are half and half—steady fellows mostly, but worrying about things that they think need correction.

In a few of these towns there are automobile manufacturers—some are busy—some are quiet—some are just paddling around.

The manufacturer who is rigged up to make twenty cars a day and selling ten deserves honest sympathy.

Here in East Moline we are making and **SELLING AND DELIVERING FOUR FINE MOLINE-KNIGHT AUTOMOBILES A DAY—**

The unfolding of our program is unusually interesting—follow us on the next three pages.

## The Moline Automobile Company

East Moline, Illinois

**T**HIS is the story of an automobile that is not like any other---our way of making and marketing cars is different---you should know how we do things, because our way may be your way. If it isn't, there is no harm done.

Now just imagine that there are **THREE OF US** going on this Voyage of Discovery. **YOU**—the man who drives an automobile—who loves a good car as he loves a good horse, the **MAN-MOTORIST** who knows there can be a Spirit in a piece of machinery—who humanizes his motor car as the locomotive engineer humanizes his great engine and who calls it by name as he speeds on and on in the silent hours of the night when a hundred human souls are behind and the green and white signal lights wink, "All's well."

**YOU**—the man who drives a car with authority and responsibility, and who knows when he has a real machine under him—**YOU ARE NUMBER ONE** in our gathering—the first man to say, "**I WILL GO ALONG ON THE VOYAGE OF DISCOVERY.**"

Next—**YOU**—**Mr. DEALER**—a man of sound, sober business sense and judgment, who rubs his eyes in bewilderment at the unbalanced merchandising methods that have come to worry and harass a great industry.

You, Mr. Dealer, who says to himself almost every day,

"When are we going to get to an even keel in this automobile industry?"—for you are realizing without us telling you that the clock has struck twelve for a new and better basis in selling the product of a great industry.

Have you ever considered what would happen to the dry goods merchant if every

other woman who bought a coat in the fall of 1913 came back this year and said:

"Mr. Jones, I paid you \$60 for this perfectly good coat last year. Now if you will allow me \$35 for it this year I will buy a new one. It is in very good condition and I really haven't worn it more than 1000 miles." Substitute automobile for coat in the conversation. Now—where do we get off?

You see the point, Mr. Dealer—won't you go along with us on the **VOYAGE OF DISCOVERY**—and see what you can find out?

Now **WE** will go along—and **FOR US** speaks a man who was a builder of engines to **CUT WOOD**, to **DRAW WATER**, to **CREATE POWER**—long before a self-propelled wagon was dreamed of as a commercial possibility—and he and his men were building fine, powerful, efficient stationary engines—and they are building them today.

We claim the right to lead the way because we were not born into the automobile business by accident—by promoters or by any other process except the natural and proper evolution of the engineering experience, knowledge and habit, all of which we logically transferred to our Moline-Knight automobile business.

These are **OUR CREDENTIALS** as makers of automobiles and our warrant for inviting **YOU**, Mr. Man **WHO DRIVES A CAR**, and **YOU, MR. DEALER WHO SELLS THE CAR**, to travel with us.



# How Shall We Journey and Where Shall We Go?

Our Moline-Knight is at the door—jump in, Man-Motorist, and take the wheel—and you, Mr. Dealer, come into the tonneau and we will ride with you. The car starts without jar or crack—it moves—a soft, sweet purr that indicates perfect unison of moving parts and balanced engineering, the fascination of the silent, positive, powerful impulse of the Moline-Knight engine brings a smile to Man-Motorist. We are now on a straight road, he lets her out—40-42-48-50-54-60 miles shows on the dial of the Warner.

For the first time he speaks, "GEE, WHAT AN ENGINE," he says, and then he lays down to real work—WE grip our hats, the grit bites our faces, the trees fly by like the telegraph poles when you glance back out of the window of the Twentieth Century.

We call, "Slow down a little," and he smiles, pulls her down to 50-45-40-35-20 miles and the engine still purrs, sweetly, softly and the Moline-Knight rolls on.

WHAT SAY YOU, MR. DEALER?—You have driven dozens of cars—you have ridden in the Great Packard—the Powerful Pierce-Arrow and almost every other good car—

What do YOU think of the Moline-Knight?

As he looks out over the fields the thoughts that run through his mind are, "These men have a wonderful machine. I wonder if they know it?" And dealer-like he says nothing, but he looks about in the

car, he notes the shape of the stream line car body, the graceful beauty. He has tested the riding qualities, he notes the trim, the fittings, the elegant finish—the comfortable upholstery. He makes a suggestion here and there, details of refinement, but the power, the silence, the pull of that engine dominates him.

Then he says (because he is a dealer), "What's the price and the dealer's discount?" and we tell him.

Then he asks, "Do you think I could sell this car; I'm in a country town—not many people to buy a fine car?"

In every town there are the bankers, the lawyers, the merchants, the doctor, the manufacturers—a splendid group of upstanding, moderately wealthy or well-to-do men of the type of Man-Motorist who is driving—"There are more prospects than you imagine."

"How many Moline-Knight cars would I have to take to start selling this car?"

"Not many—we would rather sell you three than six to start with if three is the safest number for you to buy."

And Man-Automobilist drives on and when he draws up in front of the starting place he alights and puts his hand on the radiator. He finds it cool—he opens the bonnet—and looks with a critical eye at every part and bearing.

"Fine car," he says, "You gentlemen have the kind of an automobile that is going to stay on the map. It's the goods."

# We have 1,200 cars of this type to market in 12 mos. They WILL be marketed.

Four cars every business day—not a tremendously big job—but we want to make a FINE JOB OF IT—and we want these cars to be sold right.

The Moline-Knight is an automobile that a group of real automobile dealers may sell and in the selling add a real asset to their business.

The Moline-Knight has the engine that under the watchful eye of the engineering experts of the Automobile Club of America ran 338 hours continuously—2 weeks, day and night—averaging 38 horse power—ending up with 53 horse power at 1682 revolutions a minute—14,700 miles at 45 miles an hour.

We could not have built such an engine had we not been engine builders.

This corporation is committed to the policy of building carefully—scientifically—accurately—

That is why we make only four cars a day.

The buyer gets this magnificent 5-passenger, four-cylinder car for \$2400.

The price means nothing—it might be \$10,000 and the car no better.

And just one more thought before we put it up to you, Mr. Dealer.

Not for the purpose of selling the four cars per day, that we will make the balance of this year—but as a business insurance—as a wise precaution to help YOU sell our increased production in 1915—watch for our advertisements in the big national magazines such as the Saturday Evening Post, Collier's, Literary Digest, Life.

You will find these leading publications in the homes in YOUR town—they are read by the prospects on YOUR MAILING LIST—they reach the men YOU WANT TO SELL.

We have more to tell you. Write us. Let us know if you want to sell a car in a SPECIAL CLASS. Prove to us you are one of those SPECIAL CLASS men, for the Moline-Knight is a special class car.

The Voyage of Discovery is not finished—there is more to tell you. Today is a good day to say to us—"Your proposition interests me."

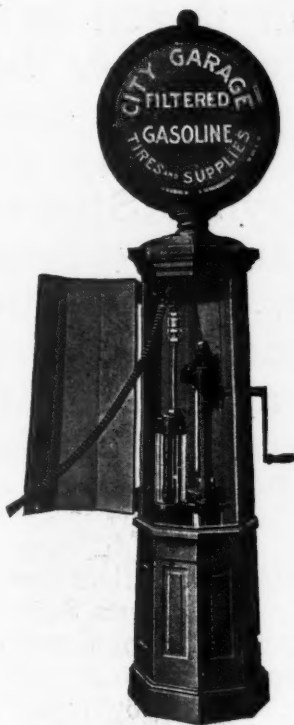
## Moline Automobile Company

East Moline, Illinois



# Special Announcement to Dealers and Garagemen Concerning

## QUALITY TOKHEIM OIL AND GASOLINE OUTFITS



Curb Post Outfit No. 14. The double sign—electrically illuminated—attracts the attention of all who pass. Pays for itself by increasing business.

We are now prepared to offer dealers and garagemen throughout the country the agency for the **complete** line of TOKHEIM Oil and Gasoline Outfits. Not the agency for private garage outfits only but for public garage outfits as well.

We also wish to announce that our prices have been **materially** reduced—thereby increasing the sales possibilities of TOKHEIM Outfits **tremendously**.

The reputation of TOKHEIM Outfits is world-wide. Fourteen years of accumulated experience has been built into them. Every TOKHEIM Pump and Tank bears the Underwriters' label. TOKHEIM Outfits are in use by the U. S. Government—irrefutable evidence of their reliability and accuracy.

**DEALERS:** If you can give us the right kind of representation—the quality support that a quality product merits, we have a proposition of interest for you. Some choice territory still open. Write or wire **at once**.

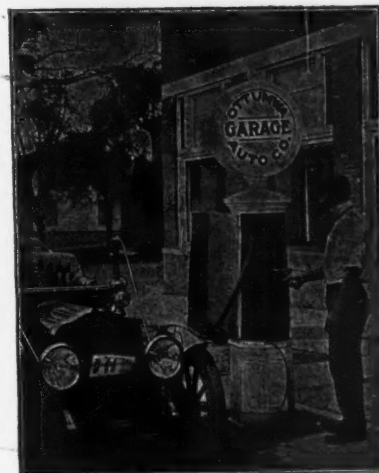
**MOTORISTS:** If your dealer cannot supply you with a TOKHEIM Outfit, write us direct and we will see that you are taken care of. We especially recommend Safety Gasoline Outfit No. 27—one of many styles—for private garages. It protects valuable property, valuable cars, and *soon pays for itself*. Send us your requirements and we will send detailed information concerning outfits best adapted to your needs.

### THE TOKHEIM MFG. CO.

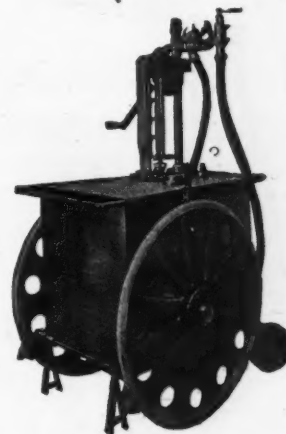
MAIN OFFICE AND FACTORY

815-19 North First St., West

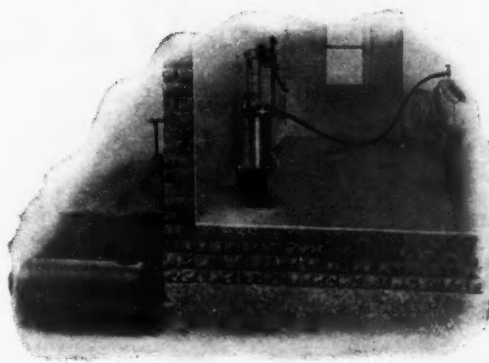
Cedar Rapids, Iowa



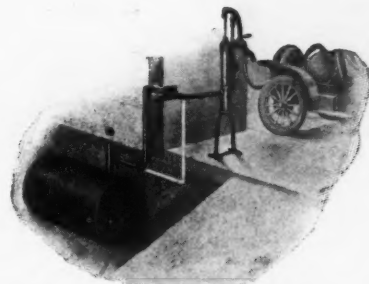
Showing handsome appearance of Curb Post Outfit No. 14 installed. Note double illuminated sign advertising the dealer.



PORTABLE GASOLINE OUTFIT NO. 16. Highest type of construction. Welded tank. Quick discharge, self-measuring pump.



"HAWKEYE" Gasoline System. Discharge 10 gallons per minute. "ACRO" Gasoline System. Discharge 20 gallons per minute. Quick-repair types. For Public Garage, Dealer and Factory. Tanks any size.



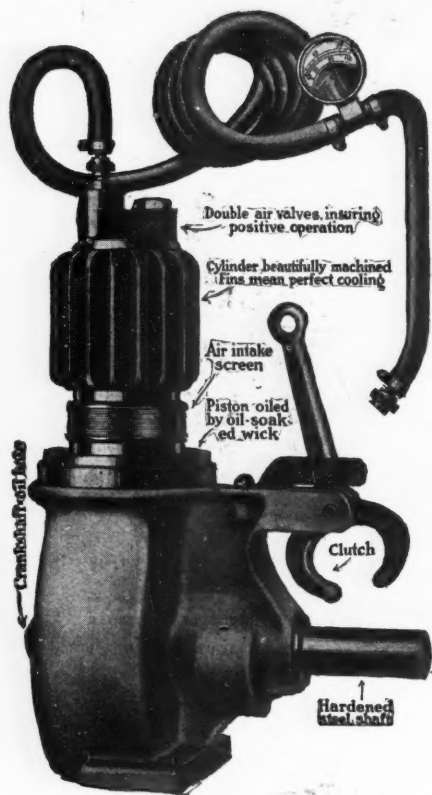
Private Garage Safety Outfit No. 27.

## One of the Most Necessary Things for your car is a Stewart Tire Pump

PEOPLE are sick and tired of blowing up tires with hand pumps, and yet your tires *must* be kept up to proper pressure, or you suffer expense and inconvenience. What car owners want is a reliable, efficient tire pump mounted on, and driven by the motor.

You may carry one extra,

inflated tire, but if you have *any* tire trouble, *someone* has got to blow up that tire *some-time, somewhere*. Many car owners are buying Stewart Tire Pumps and attaching them themselves, or having the installation made by dealers and garage men, and so are relieving themselves, of this awful hoodoo of tire troubles.



Don't fool any more of your strength, time and patience away on hand pumping. The Stewart Tire Pump only costs \$15. It pumps up a big tire in five minutes or less. It is mounted on and connected with your motor, and all you have to do is to push over a little lever, and look on until your tires are blown way up to **proper pressure**. The Stewart Tire Pump makes it *easy* to keep your tires inflated to the pressure **stipulated by the maker**, thus avoiding rim-cutting, breaking of fabric and other evils of a soft tire.

The Stewart is the most efficient, finely finished, reliable tire pump you can get. The piston is steel; the connecting rod hardened steel; the cylinder beautifully finished, having fins for perfect air cooling. The piston is oiled by rubbing against a wick, upon which oil is dropped from the outside. This is the **only** piston pump that absolutely prevents oil from getting into tires. No rubber or leather packings to wear out and cause leakage. The base is aluminum. Price complete with air-pressure gauge and 12 feet of high-grade hose, only - -

Be sure that there is a Stewart Tire Pump on the new car you buy.

# \$15

**Stewart-Warner Speedometer Corporation**

Executive Offices: 1967 Diversey Boulevard, Chicago

Factories: Chicago and Beloit, Wisc.

*17 Branches. Service Stations in all cities and large towns*



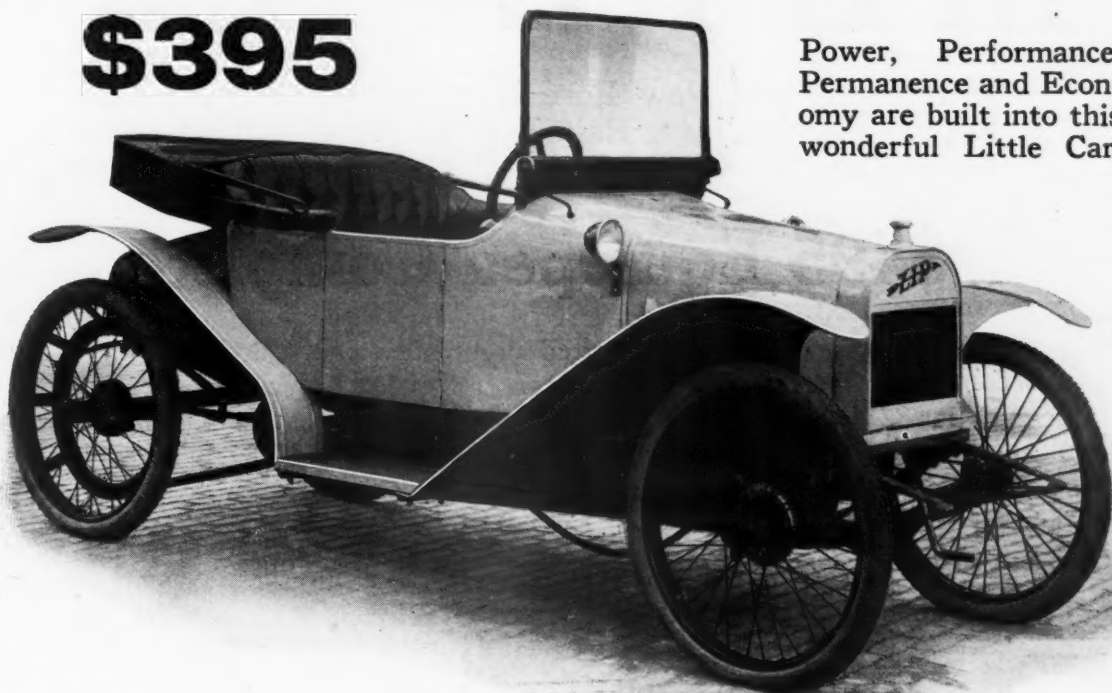
The New



Light Car

**\$395**

Power, Performance,  
Permanence and Econ-  
omy are built into this  
wonderful Little Car.



**W**HY has there been all this "Light weight car" talk for the past several seasons? Simply because car owners and prospective car owners want a greater economy in the automobile they buy.

The Zip Light Car is the most economical today manufactured—it is the cheapest to buy and to maintain two-passenger automobile on the market. That is exactly why the New Zip Light Car is selling so fast in every section of the country.

POWER, PERFORMANCE, PERMANENCE AND ECONOMY are all built into this wonderful little car.

The New Zip Light High-Power Four-Cylinder Water-Cooled Motor has put the Zip Car in a class by itself.

The Zip will develop a speed of 45 miles an hour—give 30 to 40 miles on a gallon of gasoline—and consume less than a gallon of oil for every 500 miles—gives 8,000 to 10,000 miles on a single set of tires, costing less than \$40.00, go anywhere any automobile will go—take many roads that heavier cars will not take—and actually rides easier than any other automobile built. (You won't believe this statement until you have ridden in a Zip.)

#### SPECIFICATIONS

**Long Wheel Base:** Four-Cylinder water-cooled 16-H.P. Motor—Full Elliptic Springs, wire wheels, and a total weight of less than 800 pounds.

**Motor:** Four-cylinder Water-Cooled Thermo Syphon—Bore 2½ inches. Stroke 4 inches. Horse Power 10 to 16. Lubrication Plunger Pump and Splash Crank Shaft High Carbon heat treated. Turning Gears C. I. and steel. Cylinder Head removable as well as lower half of crank case, giving accessibility found in no other motor. Magneto on left side. Valves on right side.

**Transmission:** Friction Type transmission. Any number speeds forward and reverse.

**Frame:** Channel Section Pressed Steel. Four Cross members

reinforced with ten gussets. Strongest and finest frame used in light car.

**Springs:** Full Elliptic Front and Rear.

**Axles:** Front and Rear Axles. I Beam Section Drop Forging.

**Tires:** 28x2½.

**Brakes:** Expanding Brakes operating on inside drum on rear wheels.

**Steering Wheels:** Rack and Pinion Type.

**Body:** Roadster Type 4-door type, side by side seats.

**Equipment:** Six (6) Volt 40 Ampere Hour Storage Battery. Electric Head Lights and Tail Lights. Electric Horn and Top. Storm Shield.

### WE WANT LIVE DEALERS

Dealers in every section of the country from Maine to California are selling the Zip Light Car in big quantities. We still have open territory and will be glad to have any dealer write or wire us for our special dealer's proposition.

The day of the light car is here. The continuous talk of Light Motor Car Manufacturers along this line proves it, and the Zip stands in a class by itself among light cars.

**Zip Cyclecar Co., 865 W. Second St., Davenport, Iowa**

# METZ "22"

Introducing the New Fore Door Model, Stream Line Body, Plate Glass Rain-Vision Wind Shield—The Ideal Car for Cross Country Driving or City Use

## \$495 Equipped Complete

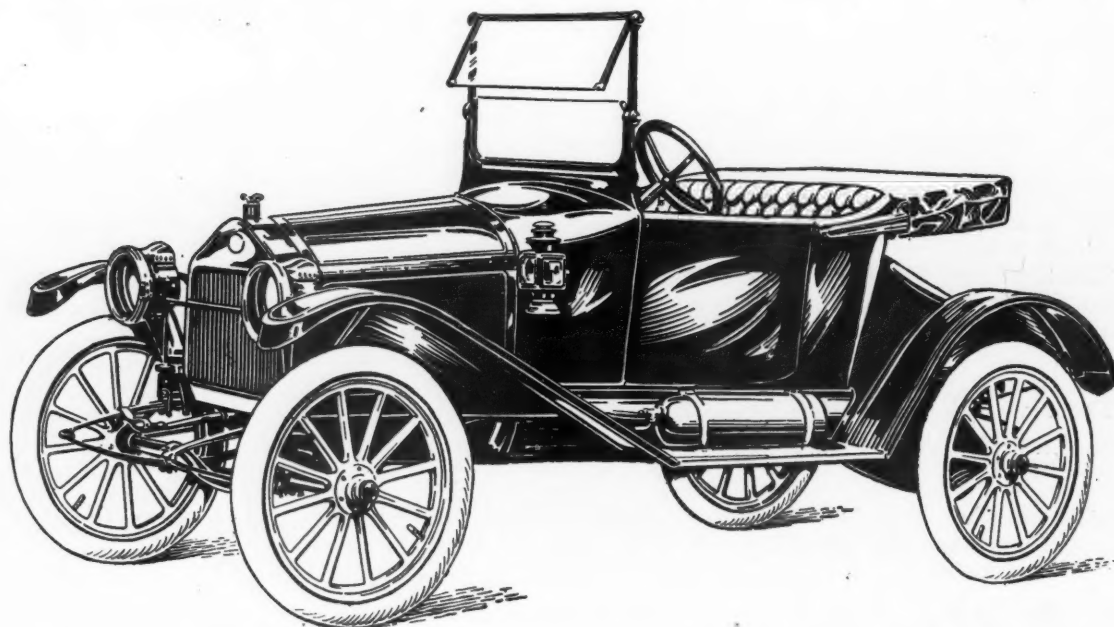
Big, roomy seats, with thick, tufted upholstery and deep cushions, built for luxurious comfort.

Four-cylinder 22½ H. P. water-cooled motor, Bosch high tension magneto, Prest-O-Lite tank, best quality Goodrich clincher tires.

Fore doors of liberal dimensions, 20 inches wide.

Left-hand drive, with center control.

**Gearless Transmission**—the kind that won the Glidden Tour.



## WINNER OF THE GLIDDEN TOUR

The METZ "22," in open competition with cars of all makes and prices, won the last Glidden Tour, from Minneapolis, Minn., to Glacier National Park, Mont., the three METZ cars being the **ONLY** cars that held *perfect scores*, without time extension or additional allowance of any kind, for the entire eight days of the contest. The METZ cars were the lowest priced cars in the tour, and they were the

only cars in it that were equipped with *gearless transmission*.

Mr. Chas. H. Metz has been building cars of this type and developing their perfection, *sixteen years*. As a result, the METZ "22" is today the most *practical* car on the market, regardless of price, horsepower, or any other qualification.

Write for New Catalog "K"

**Metz Company,**

**Waltham, Mass.**



# METZ WINS!

## WESTERN UNION TELEGRAM

UNIONTOWN, PA., JUNE 18, 1914.

METZ COMPANY,  
WALTHAM, MASS.

IN HILL CLIMBING CONTEST AT UNIONTOWN, PA., METZ WINS EVENT TWO AGAINST FIELD OF THIRTEEN SPECIAL RACING CARS, TIME FOUR MINUTES, THREE-FIFTHS SECONDS. KLINE SECOND, MERCER THIRD, CHANDLER FOURTH. FORD, MAXWELL, BUICK, OVERLAND, HUDSON IN ORDER NAMED. METZ ALSO WINS SECOND IN THE FREE FOR ALL CONTEST, BEATING FIFTEEN OF THE BIG SPECIAL RACING CARS, INCLUDING SIMPLEX, MERCEDES, PACKARD, MERCER, OLDSMOBILE, BUICK, STUTZ, LOZIER, ALL THE WAY FROM TWENTY-FIVE SECONDS TO ONE MINUTE AND TWENTY-TWO SECONDS. THIS THREE MILE CLIMB IS DECLARED TO BE THE MOST DIFFICULT IN THE COUNTRY.

CHAS. H. METZ.

## Let Facts Mould Your Opinion

If any further evidence was needed of the superiority of GEARLESS TRANSMISSION, this latest performance of the GEARLESS METZ "22" surely supplies it in overwhelming measure. METZ leads the leaders.

The METZ "22" is the most compactly built car in the world, and is extremely economical in operation and upkeep. METZ owners travel 28 to 32 miles on 1 gallon of gasoline, 100 miles on 1 pint of lubricating oil, and 10,000 to 12,000 miles on a single set of tires. It makes 50 miles per hour, and at hill climbing is unsurpassed. Its engine develops more horse power per 100 pounds of car weight than any of the big touring cars, and its gearless transmission does away entirely with gear trouble. It is easy to drive and easy to take care of, and it costs so little to buy it, and so little to run it, that it combines in greatest degree absolute *economy* with absolute *luxury*.

### TO DEALERS

The demand for a small car that is reliable in performance and economical in operation, is increasing enormously. The new METZ "22" Fore Door Model meets this demand precisely. We want a representative in every city and town. Be first in your section. Write us for terms and new Catalog "K."

**Metz Company,**

**Waltham, Mass.**

Four Cylinder Water Cooled  
 22 Horse Power Motor  
 56 in. Tread - 96 in. Wheelbase -  
 Shaft Drive  
 Full Floating Rear Axle -  
 Annular Ball Bearings  
 I-Beam Forged Front Axle -  
 Streamline Body  
 3 Speeds Forward Sliding  
 Gear Transmission  
 $\frac{3}{4}$  Elliptic Springs  
 Running Boards, Wood Wheels.

**\$ MOTOR CAR**  
**495**  
**COMPLETE**

**You are now face to face with the  
 biggest motor car opportunity of your life**

## **Partin-Palmer "20"**

### **This is YOUR Opportunity**

Before you buy a car or make a dealers' contract it's to your advantage to investigate the Partin-Palmer "20"—undoubtedly the most remarkable car in its class—a car the motorist wants and can afford to own—a car no dealer can afford to pass by.

Look over the specifications—look at the price—\$495. A real motor car, every inch of it—style—quality—reliability—and genuine economy. A most remarkable value with everything you expect in cars selling for much more.

### **How We Did It**

The Partin-Palmer six-passenger, 38 H. P., 115-inch wheelbase, at \$975 was just as big a sensation when we put it on the market a year ago. Today it has a world-wide distribution, with a host of satisfied dealers and owners.

By following the same economical manufacturing methods, we now herald the Partin-Palmer "20" at \$495—not a theory but an actual ready-to-deliver-to-you motor car—made by successful, experienced motor car builders—backed by men of unquestioned financial responsibility.

### **Creating Motor Car History**

This Partin-Palmer "20" is creating real motor car history now—it's offering to every motorist—and every dealer in the country the biggest opportunity of the kind in motor car history.

Now, Mr. Motorist—you have said you wanted a car for less than \$500—reliable—comfortable—stylish with stream line body—and plenty of power. Here is the car you and thousands of other men and women have been waiting for—a really high-grade car at just such a price.





PARTIN-PALMER "20"

Complete equipment—includes Gray & Davis generator system, electric lighting—electric horn, windshield-top curtains and dust boot-tire carrier, speedometer, tools, jack and repair kit.

**Lay aside all prejudice—Quit saying—"It can't be done"—Investigate this car for yourself—Send the coupon Today**

**Every Owner  
Every Dealer**

Whether you are an owner or a dealer you cannot afford to overlook the wonderful value offered in the Partin-Palmer "20." Now is the time to get the convincing facts—to lay aside all prejudice and quit saying, "It can't be done"—investigate this car for yourself. It will either save you money or make you money. The demand for this car is coming on with a rush—now is the time for you to learn what it will mean to you in genuine motor car value.

**2,000 Dealers  
Wanted Quickly**

Whether you want a car for your own personal use, or to act as agent, you can't get away from this offer.

To the user the Partin-Palmer "20" means the quality car he has long wanted, at the price he is willing to pay.

To the agent it means the quick seller, big money maker he has long hoped for. To demonstrate this wonderful car in your community guarantees easy sales and a big volume of immediate business.

**Send the  
Coupon today**

Every prospective automobile buyer—send the coupon today for your copy of our booklet, "The Proof," a book of convincing facts.

**Dealers  
Act NOW**

'While you are hesitating some one else may get your territory. You can't afford to let this slip through your fingers. Wire, phone or send the coupon **TODAY** to our General Sales Manager, C. C. Darnall—by return mail you will receive our Exclusive Territory Offer and Special Introductory Proposition to Dealers—

Do it NOW—tomorrow may be too late.

**Partin Manufacturing Co.**

Suite 547, 29 So. LaSalle St., Chicago, U. S. A.



Partin-Palmer "38"

**Six-passenger, 115-inch wheelbase, \$975**

Here is a big six-passenger, 115-inch wheelbase, thirty-eight-horsepower motor car that represents the biggest value in its class. Whether you are an owner or a dealer you cannot afford to overlook the wonderful value in this big, high-grade car at \$975.

Write us today for full information and complete specifications of the Partin-Palmer "38"—it will save you money and give you just the big, six-passenger car you want—a car that will take care of your every motor car desire. Ask for our very interesting book "Partin-Palmer Progress."

Partin  
Mfg. Co.,  
Suite 547, 29  
S. LaSalle St.  
Chicago,  
U. S. A.

Gentleman: You say I'll be interested in your Partin-Palmer "20" proposition. Without obligation on my part send me complete information as checked below.

( Mark X in one of the squares below )

☐ I am interested in information to dealers.  
☐ I am interested in information to motorists.

Name .....

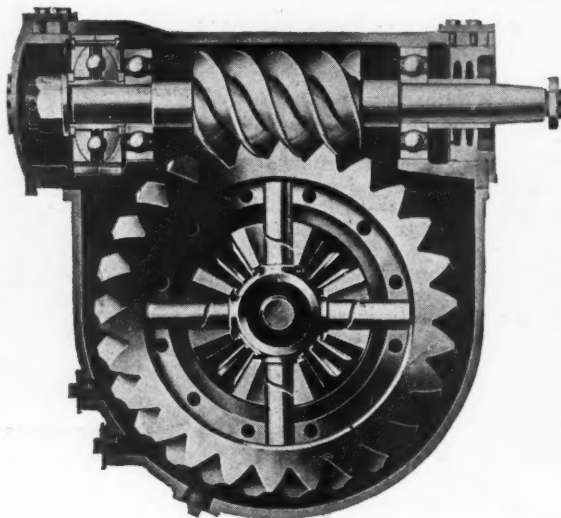
Address .....

# SHELDON



Before entering into the specific details of the superiority of the Sheldon Worm Gear Axle insofar as the gear itself is concerned as explained in our last advertisement on the subject of worm gears, we wish to establish firmly another point of superiority of Sheldon Axle construction, namely—the use of semi-floating axle construction.

By the use of this semi-floating construction, together with the simplified worm as mounted on ball bearings, we provide for an axle which is the acme of simplicity throughout its entire construction. The worm gear and differential are mounted together as a complete unit, so constructed as to be free from adjustments of any kind. This complete working unit is then mounted into a semi-floating rear axle.



avoiding the danger of crystallization, due to the use of solid tires. This, of course, refers specifically to truck construction. In the Sheldon type of axle this question of crystallization can be provided against with a far greater factor of safety than is possible in the full floating type.

## Worm Gears Capable of 80,000 Miles

### Strength and Simplicity

The use of the semi-floating axle construction is based upon the fact that this type is stronger and lighter than any other type of construction, besides being a great deal more simple. In this simplified type the dead load is carried by the axle itself rather than by a piece of tubing, as in the case of the full floating axle.

The biggest point of advantage in the supporting of the dead load as exemplified in Sheldon construction as against supporting it by means of a tube as in the full floating type lies in

The Sheldon axle is a hammered forging of chrome nickel steel of ample size to carry the load and do the driving—factors which are very easy to determine. In considering this feature of greater strength in Sheldon construction than in any other construction, and in considering the greater factor of safety made possible by Sheldon construction it should be borne in mind that it has been common experience among many of the English makers to register a mileage of from 60,000 to 80,000 miles or more from a single set of worm gears. As a matter of fact, this great life of the worm gear is one of the strongest points set forth in its favor by the devotees of this type of power transmission. It must be plainly obvious to the purchaser



## WORM GEAR AXLES—SPRINGS— FRONT AXLES BRAKE AND RADIUS ROD EQUIPMENTS

of cars of any character that it is an absolute lack of economy to buy a working unit with a life of 60,000 to 80,000 miles if the carrying unit will not live up to the possibilities of the working unit.

In other words, it is very easy to see that with the long life of the worm gear a great many years of service should be possible out of the cars carrying this construction.

### No Weakness in Any Unit

It is the aim of the Sheldon Company to produce only such completed units as will provide shafts, differentials and housings that will not wear out before the worm and wheel itself has served its usefulness. And it is our firm belief that no other type of construction than that used by the Sheldon Company could provide this service from every part of the axle.

With particular reference to the worm gear axle housing (that part which in any other type of axle construction is most certain to show up weakness), it is so substantially built that under extreme conditions or abuse the housing itself would in all probabilities be unharmed.

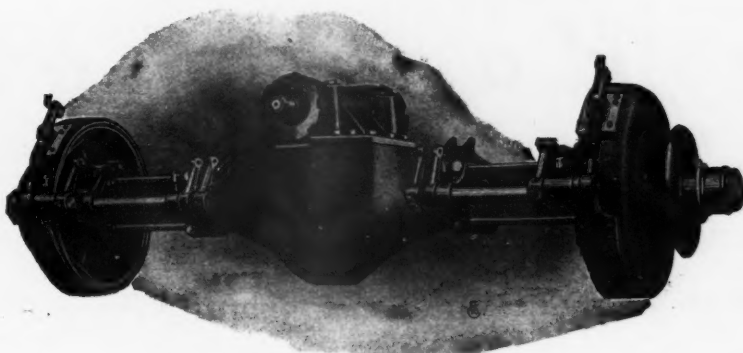
### Worm Gear Housing Practically Indestructible

If in driving you should encounter an obstacle with the centre of your axle, it is altogether like-

ly that because of this great factor of safety present in Sheldon rear axle construction you would either knock the obstacle out of the way or possibly find the rear of your truck balanced on the obstruction. There is nothing on the bottom of the housing to get knocked off, and the housing itself is built to withstand the unusual rather than the usual.

As in the case of our claim of superiority for the worm gear itself, as made in our last advertisement, so it is with the claims made herewith in regard to the construction of the completed

unit, we are stating positive known facts as to what these parts and units will do, and in the subsequent follow up we will show, point by point, in detail, just why our claims are sound and logical. Shel-



don springs, by their dominancy for more than 50 years, show very conclusively the character of the products of the Sheldon plant. The same careful attention to details, both of designing and manufacturing, that has enabled us to establish the reputation we enjoy in the spring manufacturing world is your safest guarantee of the character of all of the Sheldon products.

In the construction of Sheldon Front Axles and Sheldon Brake and Radius Rod Equipments you will find not only the finest of materials worked up under the most painstaking manufacturing effort, but also the very last word in advanced design.

## SHELDON AXLE COMPANY, Wilkesbarre, Pennsylvania

*Makers of Springs and Axles for Heavy Duty Service for More than Fifty Years*

Chicago—Peoples Gas Bldg., 122 S. Michigan Blvd.

San Francisco—444 Market Street

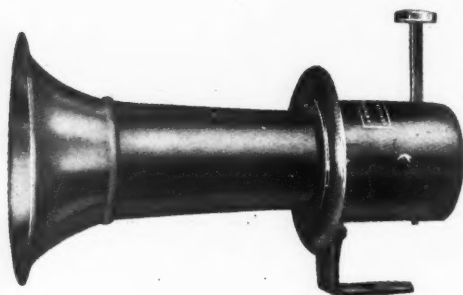
Detroit—1215 Woodward Avenue

# VICTORY *for* NEWTONE

## Klaxon Patents Declared Invalid

# \$7

**NO** Electric Wiring  
Battery Expense



# \$7

**NO** Motor Troubles  
Adjustments

## *The Handphone*

This Horn has created a sensation in the Trade for its tone, reliance, durability and low price. There is no better, more efficient or more mechanically perfect warning signal than the Handphone.

*Quantity Production Means Quantity Price*

## Newtone Horns Do Not Infringe

The Court of Appeals on June 9th unanimously rendered a decision against The Klaxon Co., by declaring all the 48 claims of all the Hutchison patents in suit **not** infringed by "Newtone," concluding that the basic claims of the patents are invalid and that the claims covering the specific details, if valid, are not infringed by our "Newtone"; with costs in favor of The Automobile Supply Mfg. Co.

This decision affirms what we have been assuring you for the last four years.

Our *Newtone Superior* (Motor-driven) and *Handphone* (mechanical) Horns are the best signals that money can buy—their low price is made possible by our enormous production and splendid manufacturing facilities.

**Orders Promptly Filled In Any Quantities**

## Automobile Supply Mfg. Co.

220 TAAFFE PLACE

BROOKLYN, N. Y.

There's no leak proof ring but the **LEAK-ROOF** Ring — insist



## GUNS and Cylinders

The purpose of the explosion is the same. In the gun it drives out the projectile—in the cylinder it drives down the piston head.

To obtain the full effect of the explosion in the gun the projectile is fitted with a flanged metal band around the rear end. This prevents the escape of the expanding gases.

The piston ring is used for the same reason. To secure such exact fit of piston head to cylinder as will make any loss either of compression or explosion impossible. In addition, the really efficient piston ring must eliminate destructive friction and at the same time keep surplus oil out of the combustion chamber.



# LEAK-ROOF Piston Rings

MADE BY MCQUAY-NORRIS MFG. CO.

comply fully with all these specifications.

The **LEAK-ROOF** Piston Ring is a two-piece ring—strong, simple, easy to adjust. Each half concentric and interlocking with the other—sealing all openings. Made of special metal possessing great and enduring elasticity. Finished to gage as accurately as constant and careful micrometer testing can make it.

**LEAK-ROOF** Rings obtain absolutely firm and equal bearing on all parts of the cylinder. Their use ensures perfect compression and full power—reduced carbonization—fuel economy and longer motor service.

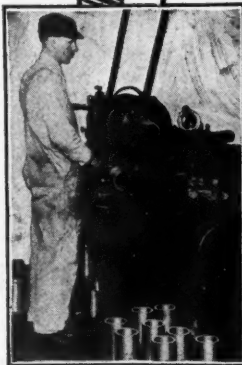
### Send for Free Booklet—

It tells all about piston rings and why you should equip your engine with the **LEAK-ROOF**. How it will pay you in fuel economy and prolonged motor life. Write for it.

### "Ask the User"



PISTON HEAD PACKING RINGS



### Forming the Rings

The rings are formed and cut from the casting on this machine. The output of each machine is about 150 rings per day—a ridiculously small number until the care and exact measurements that must be applied to this operation are taken into consideration. The forming tools are watched very closely and the rings are made with a variation of less than a one-thousandth of an inch.

**LEAK-ROOF** Piston Rings are leak-proof because such exactness is made a principle in their manufacture.

The Name  
**LEAK-ROOF**  
Stamped On  
Every Ring

In Use on  
Over 200,000 Automobiles  
and Motor Boats

Sold by all up-to-date  
dealers, garages, repair shops  
and marine stores

Manufactured by  
**MCQUAY-NORRIS MANUFACTURING CO., Dep't. M.**

St. Louis, Mo.

New York—1919-29 Broadway at 64th St.  
Pittsburg—7620 Tioga St.  
Kansas City—513 New Nelson Bldg.

Chicago—Suite 718 Michigan Bldg.,  
Michigan Ave. and Washington St.  
San Francisco—164 Hansford Bldg.

Los Angeles—224 Central Bldg.  
Canada—W. H. Banfield & Sons,  
No. 120 Adelaide St. West, Toronto.

2-A

Look for the name **LEAK-ROOF** stamped on the Ring

When Writing to Advertisers, Please Mention Motor Age.



# KING

## A Car to Venture With

**E**VERY part stronger than is necessary and fitted to its neighbor with half-hair breadth precision. Built to ARRIVE, whatever the road, and planned for a decade instead of a year. KING owners trust their cars as frontiersmen trust their Winchesters, and this is true, not only in America, but in New Zealand, Uruguay, England, the Philippines—in fact, the world over.

### HAS CANTILEVER "COMFORT" SPRINGS

*"The Car of No Regrets"*

**\$1095** WITH EQUIPMENT—Famous Ward Leonard Starting and Lighting System, \$100 net additional. Prices F. O. B. Detroit

Cantilever Rear Springs; Long Stroke Motor; 30-35 Horse Power; Unit Power Plant; Three-Point Suspension; Center Control; Gemmer Steering Gear; Complete Electric Lighting; Left Hand Steer; Full Floating Type Rear Axle; Hyatt Roller Bearings; Stromberg Carburetor; 18-inch Steering Wheel; Rain-vision Wind Shield; Silk Mohair Top; Electric Horn; 112-inch Wheel Base; 20-inch Rear Doors; Complete Equipment.

#### DEALERS, INVESTIGATE!

*We may have a proposition for your district*

**KING MOTOR CAR COMPANY, DETROIT, MICH.**

New York Agency and Showroom, Broadway at 52d Street  
New York Service Department, 244-252 West 54th Street





**\$9.50 to \$15.00**

# SPARTON

**ELECTRIC MOTOR DRIVEN AND HAND OPERATED SIGNAL**

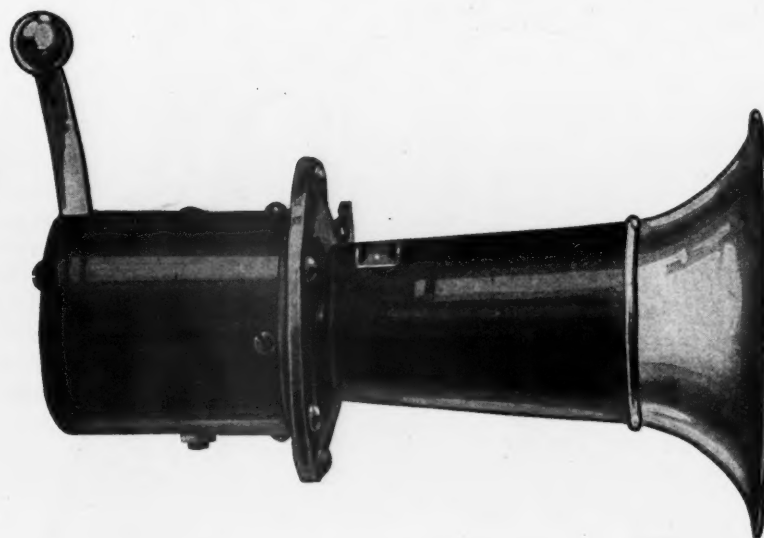
The motorist cannot afford to depend on a good enough warning signal. When the time comes for action, he must have a horn that will compel quick, unthinking, instantaneous jumping—such is the discordant, action-compelling growl of the SPARTON when the button is pushed home. On country stretches a good pressure on the button produces a warning clarion that can be heard a mile down the road, giving everyone time to get out of the way. On city streets a light touch produces an inoffensive, but authoritative command, warning people at close range.

**Hand  
Operated**

**\$7.00**

**and**

**\$8.00**



**Hand  
Operated**

**\$7.00**

**and**

**\$8.00**

**The Sparks-Withington Co., Jackson, Mich.**

# STANWELD RIMS

## Tires Removed Quickly From Stanweld Rims

**H**AVE you ever noticed that a "flat" tire usually occurs when you need your car most? And that's the time when you wish you owned the quickest and easiest operating demountable rim made—that rim is Stanweld Number Sixty.

Stanweld Demountable Rim Number Sixty

comes off the wheel by merely giving six automatic clamps two turns each. Then you unlock the toggle-lock as shown in the illustration.

Notice how the inside of the casing is made accessible without compelling you to separate the tire from the side-rings. That inner band you see in the picture is in no way attached to the casing. It can't freeze, stick or rust to the tire.

You'll never know what time and strength economy are until you own a car

equipped with Stanweld Number Sixty Demountable Rims. And they don't cost much. If you're buying a new car equipped with demountable rims, you should get Stanweld Number Sixty Rims at no added expense—merely ask for them.

Or you can have Stanweld Number Sixty Rims applied to your old car for a very moderate sum. We'll tell you where to buy them. A post-card will do. Send it today. If you prefer straight-side tires we have some information that will interest you intensely. The straight-side type of the Number Sixty Rim is made wider at the base than the old types of straight-side rims. That means a larger tire, greater air-capacity, increased riding comfort, greater tire-mileage. The Number Sixty Rim can be converted into either clincher or straight-side type by merely changing the side-rings. There are other good points about the Number Sixty—features that are incorporated in no other make of demountable rim. We'd like to tell you more about them.

### The Standard Welding Company

*Pioneers and World's Largest Producers of Rims for Motor-Driven Vehicles*

Main Office and Factory

CLEVELAND

*Distributors in Principal Cities*



The leading makes of pneumatic tires are guaranteed only when applied to rims bearing one of the accompanying inspection marks. You'll find these marks on Stanweld Rims.

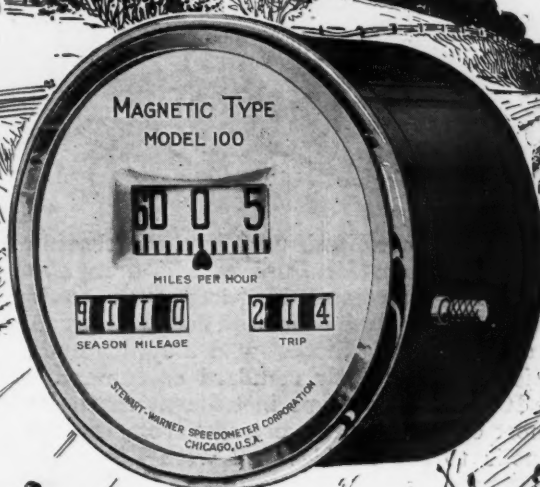


When Writing to Advertisers, Please Mention Motor Age.

Send us your name and address.



**\$12**  
**Complete and Fully Guaranteed**



## The Stewart Speedometer doubles the pleasure of driving your "FORD"

**Y**OU cannot possibly know what your "Ford" can do unless a Stewart Speedometer tells you.

*How fast will it take a certain hill on "high"? How fast will it travel along on the level? How slow can you throttle down in traffic? How many miles do you get from a gallon of gasoline—of oil? How many miles do you get out of your tires? How far have you driven by the end of the season?* These are the questions that put the real fun into motoring—and the Stewart Speedometer answers every one of them *exactly*.

It's a real, "Magnetic Type" Stewart with special equipment for attaching to

your "Ford." And it only costs \$12 complete. It has a 60 mile rotating speed dial, 10,000 mile season odometer, 100 mile trip odometer, with device for resetting to any mile or tenth of a mile, jeweled bearings, case in deep jet lacquer with polished brass trim to match your Ford car.

Don't put off the pleasure of having a Stewart Speedometer on your "Ford." Get this Stewart Speedometer **TODAY**—from your Ford dealer, or from any jobber, supply dealer, garage man, or direct from any of our Branches or Service Stations. If bought at our Branches the installation is made free.

### 30 Days Free Trial

Have a Stewart Speedometer put on your "Ford" *now*. Try it and watch it 30 days. If you are not satisfied at the end of that time, take it back and your money will be promptly refunded.

## Stewart-Warner Speedometer Cor'n

Executive Offices: 1931 Diversey Blvd., Chicago

Factories: Chicago and Beloit, Wisc.

17 Branches. Service Stations in all cities and large towns.

# EISEMANN

The magneto itself used in the Eisemann special system for Ford cars is a regular standard Eisemann Magneto such as is being used now by most of the 83 concerns in the United States who depend upon Eisemann for their standard equipment.

It is the same type instrument that sent most of the perfect score cars from Indianapolis to the Pacific—all were Eisemann equipped and every one of the 11 finished with a perfect score—the same instrument that is carrying Kohl in his Henderson around the world. In other words, the Eisemann system for Ford cars is the highest quality ignition system it is possible to produce—not a cheap makeshift to go on a low priced car. And in addition to the superiority of the magneto itself, the entire system has been designed and produced with regard to quality and efficiency only.

Installed, it becomes an integral part of the car itself—simple and noiseless in its operation—and easily and quickly installed with no altering of the Ford car itself.

If your dealer cannot supply you communicate with us and we will see that you are cared for.

**Eisemann Quality is  
Present Throughout the  
Entire Ford System**

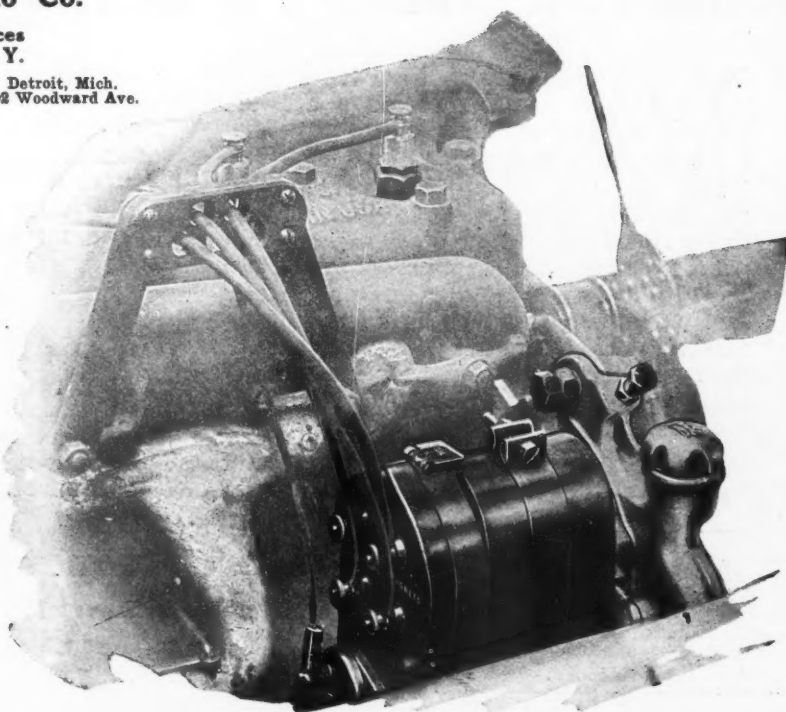
## **The Eisemann Magneto Co.**

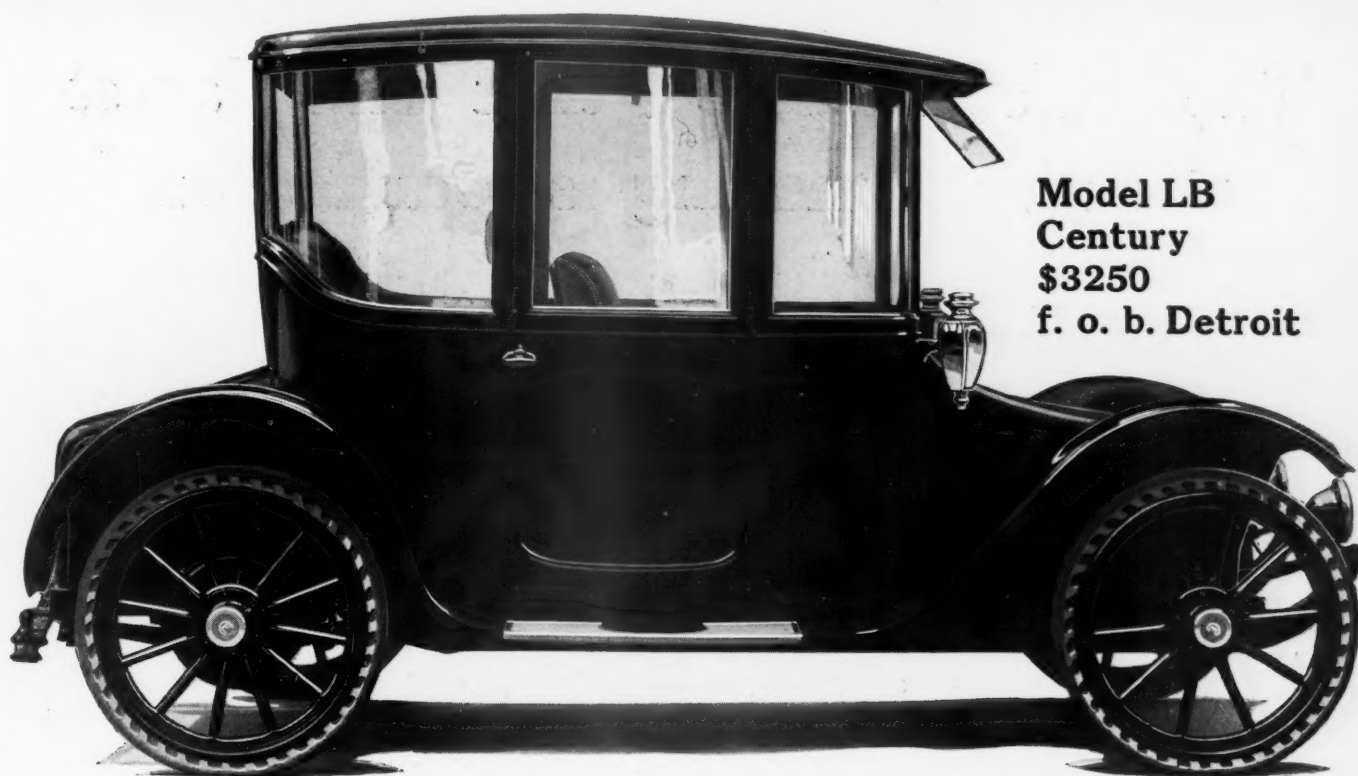
**Sales and General Offices**  
32-33d St., Brooklyn, N. Y.

New York  
123 W. 52d St.

Indianapolis, Ind.  
514 N. Capitol Ave.

Detroit, Mich.  
802 Woodward Ave.





Model LB  
Century  
\$3250  
f. o. b. Detroit

## CENTURY ELECTRICS

**This is the latest Century that is Creating  
the "Disturbance" in the Electric Car Field**

**C**ENTURY Electrics have always been designed and laid out irrespective of price. The dominating idea has always been to perfect the best electric ever built. The only question always asked of every piece of material and every part being, "Is it the *best?*" If it was the best from every standpoint it was deemed worthy to go into Century construction.

And that is why the Century always stands up and why three years' service in the hands of hundreds of users in every section of the country contributes unfaltering testimony to the fact that the Century gives

splendidly satisfactory service to every user.

And now everywhere it is conceded that this latest double-drive Century is the best looking electric car ever built. It has the graceful lines and the perfect proportions that mean beauty. Its finish is not surpassed by any car at any price and its appointments are luxurious and in perfect taste.

It has the "appeal to the eye" that wins buyers. It is at once distinctive and distinguished in appearance. It is the type of car that creates pride of ownership. But Century success is founded on more than beauty, important though that is in the sale and purchase of an electric pleasure vehicle.



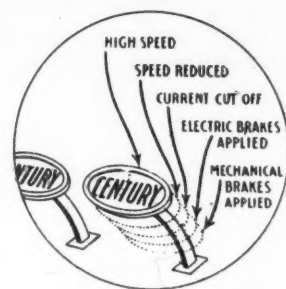
# The "disturbance" that this latest Century is making is founded on mechanical superiority

This double-drive Century has many advantages that are not shared with any other car. And they are features that appeal to the experienced electric car buyer—especially when he knows that the Century is backed by a strong, financially sound organization that is a guarantee of the permanence of his investment—an assurance that SERVICE will never be lacking.

First in importance among these advantages is the

## Century Magnetic Control The Greatest Improvement Ever Made in Electric Cars

This marvelously simple device is revolutionizing the driving of an electric car. It is seemingly possessed of almost superhuman intelligence. It stops, starts, slows down, and speeds up the car—and does it without any fussing with keys, switches or levers. **One foot pedal moving up and down within a range of three inches does it all.**



There is nothing experimental about the Century Magnetic Control. It is built for us by the Cutler-Hammer Mfg. Co., Milwaukee, who have a world-wide reputation for making the finest electric-controlling devices money can buy. Cutler-Hammer electric controls are used in electric passenger and freight elevators of the most highly perfected types and on magnificent printing presses, whose cost runs into tens of thousands of dollars; they are used to control the movements of the big, heavy gun turrets on U. S. battleships; to control the locks on the Panama canal, and everywhere that positive, unflinching reliability is required and demanded.

This Century Magnetic Control is not a new thing awaiting the verdict of the public as to its success or practicability. It is the crowning achievement of an organization which, for twenty-three years, has de-

voted all its resources to the development and building of electric controls. Its application to the Century is exclusive. **You can get this Century Magnetic Control in no other electric car.**

Every person who operates the Century Magnetic Control (and everyone can learn how to do it in a few minutes) marvels at its simplicity. In a very short time every movement becomes automatic—instinctive. One does not have to think what to do next. The right foot does the right thing instinctively. No wonder those who drive the Century—who have threaded through the traffic of a big city without the slightest nervousness or strain—describe the Century as "The Car of Instinctive Control."

This Magnetic Control costs more but **it is the best** and that is why you find it in the Century.

## Century Electric Brakes Another Big Feature

Closely and intimately connected to the Magnetic Control are the Electric Brakes which positively prevent skidding. **The Century cannot skid**—even on wet and slippery pavements with the electric brake applied abruptly when running at full speed. A demonstration of this feature awaits every prospective dealer and purchaser of a Century electric—and a demonstration is more powerful and convincing than a thousand arguments and reasons why.

This non-skidding feature is the last word in SAFETY.

And it's another reason why there is quick appreciation of the Century wherever the car is demonstrated. Ask us the "why" of this feature if you are interested.

We will be glad to answer questions—still better pleased to give demonstrations.



## **The Directions for Changing the Century Drive from Front Seat to Rear or Rear to Front with Utmost Safety and Dispatch can be given in Eleven Words**

To change from rear to front—"Take out master key and insert in hole at front seat." That's all. To change the other way, reverse the operation. Could anything be simpler? Can you imagine the pleasure in selling or driving an electric where instructions can be so briefly and so plainly given—so easily followed?

The Century has the simplest Duplex Drive in the world. Do you wonder that women who inspect it are "crazy about the Century?"

We submit that this is absolutely the best Duplex Drive obtainable. It had to be, to be adopted by the Century.

### **Triple Platform Spring Suspension**

The spring suspension of the Century is recognized by experts as **ideal**. Users say the Century is the easiest riding electric built. Century springs are made from the finest Silico Manganese steel specially heat treated. The triple platform rear spring is  $1\frac{3}{4}$  inches wide, sides  $45\frac{5}{8}$  inches long, cross spring  $39\frac{1}{2}$  inches long. Front springs are semi-elliptic,  $1\frac{3}{4}$  inches wide and 43 inches long. Total spring length is in excess of 216 inches. The best in spring suspension is none too good for the Century.

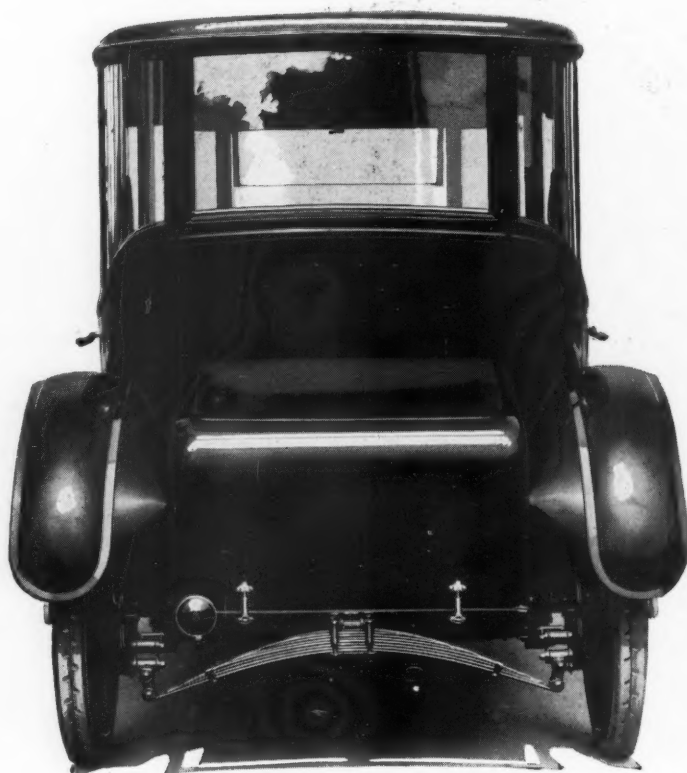
### **Low Body Suspension**

Low body suspension—bringing the body close to the ground—adds to the feeling of safety—makes the center of gravity low—gives the maximum in "safety first."

### **Timken Axles, Front and Rear**

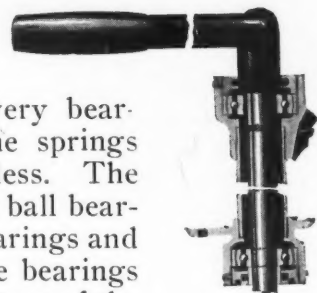
It is unnecessary to praise Timken axles to dealers and the public. It is known that they cost more because they are better. It is likewise known that a car has to be correctly engineered before it can get the co-operation of the Timken organization and the use of Timken Axles.

In building the Century we use the best at every point. Nothing less will do.



## The Century a Wonderfully Clean Car

Frequent doping and oiling is unnecessary. And yet every bearing and every moving part is perfectly lubricated. The springs work in graphited bushings, self lubricating and noiseless. The steering columns are mounted on imported self-aligning ball bearings, the steering knuckles on extra large Timken roller bearings and even the brake rods are mounted on ball bearings. These bearings contribute to the remarkable ease of steering that is a feature of the Century and they require lubrication not oftener than once a season.



Ball Bearing  
Steering Post

Those are some of the big features of the Century. Throughout you will notice thousands of minor refinements that show the care employed in designing every detail of the finest electric car built.

## Some Live Thoughts for Live Dealers. Get Them

Do you begin to see why this double-drive Century is creating a disturbance in the electric car market? Why buyers everywhere are asking dealers, "What do you know about the Century"?

Do you really and truly appreciate what a big thing it means for any dealer to have a car that includes within itself so many striking points of superiority?

Do you begin to see why big electric car distributors and dealers everywhere are writing for territory? Why even dealers who have never handled electrics are figuring on making Fall

and Winter profits pushing the Century? Think for a moment of the absolute mechanical supremacy of the Century. Recollect that the Century organization is not a new nor an untried one—and this remarkable double-drive model is the unhampered development of three years' specialization and study.

Then get in touch with us immediately—you will want to be the dealer in your locality to have the sales right for "the car of Instinctive Control." We suggest that you note the financial and manufacturing strength of our organization—and then—**apply at once** for territory.

**Century Electric Car Company,**

**Detroit, Michigan**





**Bosch Magneto**  
is the most popular  
ignition source.

**Bosch Plugs the**  
most dependable spark plugs. The result of the  
500-mile Sweepstakes proves it beyond a doubt

1st Delage .....	Bosch Magneto.....	(Foreign Plugs)
2nd Peugeot .....	(Foreign Magneto).....	Bosch Plugs
3rd Delage .....	Bosch Magneto.....	Bosch Plugs
4th Peugeot .....	Bosch Magneto.....	(Foreign Plugs)
5th Stutz .....	Bosch Magneto.....	Bosch Plugs
6th Excelsior .....	Bosch Magneto.....	Bosch Plugs
7th Sunbeam .....	Bosch Magneto.....	(Foreign Plugs)
8th Beaver Bullet.....	Bosch Magneto.....	Bosch Plugs
9th Maxwell .....	Bosch Magneto.....	Bosch Plugs
10th Duesenberg .....	Bosch Magneto.....	Bosch Plugs
11th Duesenberg .....	Bosch Magneto.....	Bosch Plugs
12th Mercedes .....	Bosch Magneto.....	Bosch Plugs

*There is no ignition as good as magneto ignition. There is no magneto as good as the Bosch Magneto, and Bosch Plugs are as good as Bosch Magnetos*

**Be Satisfied**

**Specify Bosch**

**Correspondence Invited**

**Bosch Magneto Company, 314 West 46th Street, New York, N. Y.**

Chicago  
Detroit

*199 Service Stations to Serve Bosch Users*

San Francisco  
Toronto

---

# Mosler Vesuvius Plugs



Have no equals for speed  
and power.

Made to fit any engine,  
any thread.

Stone Insulation is prac-  
tically unbreakable.

Unique method of assem-  
bly renders Vesuvius  
Plugs absolutely gas  
tight and insures perfect  
adjustment of sparking  
points.

**A. R. MOSLER & CO**  
**NEW YORK N. Y.**

---

# **POWERFUL INDESTRUCTIBLE AND SURE**

**Powerful because of faultless design.**

**Indestructible because of the finest materials.**

**Sure because of methods and workmanship employed in manufacture.**

## **EXCLUSIVE FEATURE**

**Note ears on collar.**

**The only plug that has means for assembly without rotating the insulator.**

**Washer and ears take up all friction of the nut and give the direct straight pressure which makes the plug absolutely gas tight.**



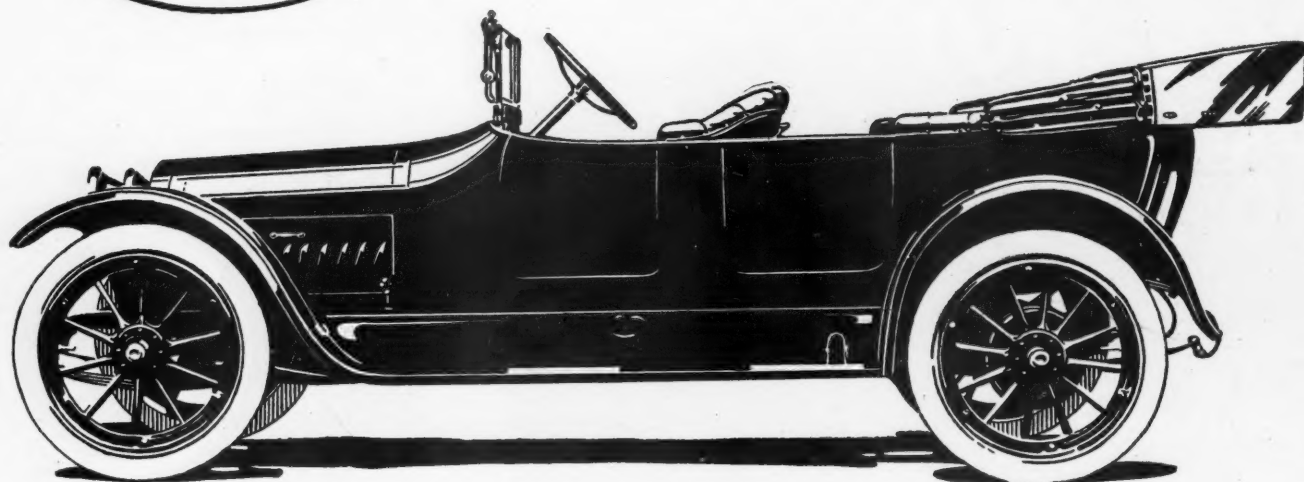
**Collar takes up friction of nut.**

**Collar cannot turn when nut is tightened because ears on collar fit into slots in shell.**





**\$1085 INCLUDING ELECTRIC  
STARTING & LIGHTING**



## The New Regal—A Thoroughbred at a Popular Price

**An overhung car—a one-chassis car—a big-production car—backed by a \$3,000,000 company**

**It's a car that doesn't carry the price-mark on it**—the lines are those of a \$6,000 car most admired at the last London exhibit.

**A car that will really hold five people**—not crowded and jammed together—but comfortably. Plenty of body room and foot room in both driver's seat and tonneau; 23-inch tonneau doors—rear seat 48 inches wide.

**A motor that will just skim over the hills**—39 h. p. on actual brake test—and an electric starting device that is the simplest and most efficient yet produced.

The new Regal will be made in tens of thousands—our whole big 10-acre factory will be devoted to this one chassis, with roadster and touring bodies.

You can get prompt deliveries, so that you won't lose sales through no fault of your own—and your profit will be satisfactory.

We are buying advertising for the new Regal just as we buy material—so much advertising for every car; and the amount will run well into the hundreds of thousands of dollars.

It starts with a 2-page spread in the June 20th issue of the Saturday Evening Post, and will be followed by page advertisements

regularly in the other big weeklies. Large space will also be used continuously in the farm papers, trade papers, and over a hundred newspapers—all at our expense.

### Quick Action Necessary

We are strengthening our organization at every point. We are after good dealers in every locality. The new Regal is already being turned out in quantity, and reservations are pouring in on us. Our distributors and dealers who have tried out the new Regal are doubling and trebling their specifications.

Don't delay, but write or telegraph at once regarding territory, or come in to the factory.

### WHAT THE REGAL BUYER GETS

Direct Electric Starter	Left Side Drive
Electric Lights, with "Dimmer"	Center Control
Electric Horn	300 to 500 lbs. Less Weight
Simplified Electric Wiring	112-inch Wheel Base
Removable Motor Head	Unusual Foreign Design
Gasoline Saver Valves	23-inch Tonneau Doors
Extra Size Brakes—12 inches	48-inch Rear Seat
Hidden Radiator Cap	Adjustable Wind Shield
One-Man Top	Inside Curtains

**SPECIFICATIONS:** **Motor,** 4 cylinders, cast en bloc— $3\frac{3}{4}$  x 5. Removable motor top, giving easy access to pistons and valves. Three point suspension. **Starting:** Electric, acting directly on fly-wheel; three sources of power—generator, storage battery and dry cells. **Drive:** Left side, with center control. All operating controls on dash. **Springs:** Front, semi-elliptic; rear, three-quarter elliptic. **Ignition:** Atwater-Kent Unisarker, delivering single spark and automatically adjusting itself to engine speed. **Axles:** Front, I-beam, drop forged; rear, three-quarter floating. **Brakes:** Internal expanding, external contracting; 12-inch brake-drums. **Body:** Full stream-line—hidden radiator cap. **Wheelbase:** 112-inches. **Weight:** Under 2,400 pounds with all equipment. **Equipment:** One-man top; inside curtains; electric head-lights with dimmer attachment; electric tail-light; electric horn with button in center of steering wheel; 32 x  $3\frac{1}{2}$ -inch tires; demountable rims, with one extra rim; clear-vision windshield; tools and tire repair kit.

**THE REGAL MOTOR CAR COMPANY, 120 Piquette Ave., Detroit, Mich.**  
**Canadian Factory: Berlin, Ontario**

*When Writing to Advertisers, Please Mention Motor Age.*

# 'DON'T GO ROWING GO FERROWING



**It Gets  
You There and  
Brings You Back**

That's the most desirable feature of any rowboat motor—*reliability*. Pretty paint and nice sounding phrases may attract you, but they don't propel your boat.

When you buy a FERRO you get a perfect little marine engine, designed and built by an organization already world-famous for its motors. The FERRO is not an experiment, but the outcome of many years of experience and exhaustive research in the marine engine field. It combines every good point of other rowboat motors, with more unique features, such as the Bosch Reversible Waterproof Magneto, Bosch Shock-proof and Waterproof Spark Plug, and genuine float-feed carburetor. Simple and sturdy in construction, economical in operation, and most reliable in constant service, the FERRO Rowboat Motor will prove itself worthy of every claim.

If you are a live wire, you'll find our dealer proposition most attractive and remunerative. Check coupon if you're interested.



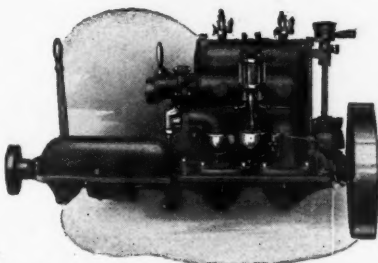
**.85**

Equipped with Bosch Reversible Waterproof Magneto and Spark Plug.

(\$65.00 with Waterproof Coil and Battery Ignition.)



There's most convincing information in our catalog No. 110. Write for it at once.



6 H. P. "Special" Ferro Marine Engine

## FERRO Marine Engines

A most complete line of high-grade marine gasoline engines designed and made in a plant where every detail from the selection of the material best adapted to each part, to the perfect control of every process in their manufacture, is carefully studied with a view to producing engines that will meet the tests of the most severe service, require the least knowledge to operate and give the least trouble mechanically.

That is why FERRO engines are universally used and recommended for consistent and dependable performance. Our marine engine catalog fully illustrates and describes each motor.

**Check this coupon and mail it today.  
It will bring you information that is  
both interesting and valuable.**



### THE FERRO MACHINE & FOUNDRY COMPANY

*Largest Makers of Marine Engines*

623-N Hubbard Avenue

Cleveland, Ohio, U. S. A.

Send me at once the books I have checked:

☐ User's Catalog of Ferro

☐ Dealer's Catalog of Ferro

☐ Rowboat Motor

☐ Rowboat Motor

☐ Complete Catalog of Ferro Marine Engines

Name .....

Address .....

Town .....State .....

When Writing to Advertisers, Please Mention Motor Age.

Buy Fewer  
Inner Tubes

Use

# Firestone

## Red Tubes

### -They Last-

Firestone Tire and Rubber Co.  
Akron Ohio.



When Writing to Advertisers, Please Mention Motor Age.





Official Road Race Champion

## Consistent performance again wins for the Sturdy Stutz

**N**OW that the smoke and noise of the International 500-mile race has died down let us look straight at the important facts. The Sturdy Stutz proved its class in competition with the world's best speed cars. The performance of the Stutz in this race, crowning its many past demonstrations of superiority, indicate the long life and sturdy service your Stutz car will give in everyday use. Stutz racers and Stutz touring cars are built in the same Stutz factories by the same engineers with the same quality of materials, the same methods of manufacture, the same skill and workmanship and the same designs.

You actually get in the Stutz you buy the qualities that placed the Stutz **FIRST** among the American cars to finish the International 500-mile Sweepstakes.

### America's fastest 301-450 class car

By outclassing every other American entry in the 500-mile race, the Stutz has clinched its supremacy among 301-450 class cars built in America.

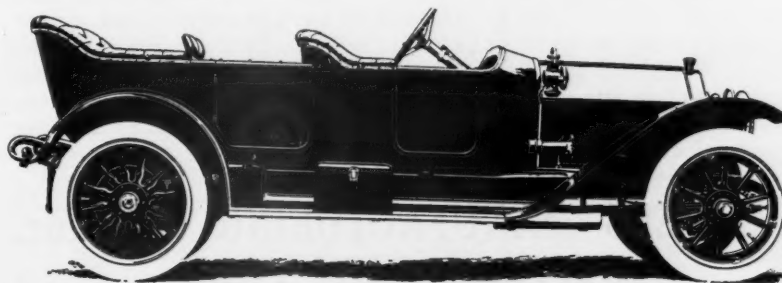
The Stutz occupies the limelight. It is America's fastest 301-450 class car. Its record of 78.15 miles per hour for 500 miles is within two and one-half minutes of the former speedway record held by an American 600 cubic inch class car.

### Comparison enhances Stutz value

A foreign car of special motor and chassis construction means nothing as applied to your daily needs and pleasures as a motorist. A comparison of the foreign specials with the factory-made Stutz only magnifies the superb performance of the latter. The splendid value of the Sturdy Stutz is actually enhanced by the comparison.

Stutz cars have always vindicated our faith in their genuine quality—their ability to **MAKE GOOD**. The Stutz will satisfy your demands. You will never regret owning a Sturdy Stutz.

*A copy of the complete Stutz racing record and catalog A-2 containing actual photographs of regular Stutz models will be sent free upon request. Write today—don't wait.*



**STUTZ MOTOR CAR COMPANY of INDIANAPOLIS**





# \$42.



## The Price of this Fedders Ford Radiator has been Reduced to \$42.

So great has been the demand for special Fedders V shaped radiators built for Ford cars that the increased output has enabled us to reduce the retail price of this type radiator to \$42. This change in the retail price does not affect the discounts to the trade which are the same as before.

These special radiators are made up in quantity lots and obviously the greater the quantity that we can build at one time the cheaper the manufacturing cost. It is due, therefore, to this increased demand that we are able to save enough on the manufacturing cost to reduce the retail price to \$42. In other words, Fedders quality and Fedders efficiency are present in this radiator at \$42 to the same degree as they were in the \$45 radiator—which means that this radiator is the highest quality and the most efficient product that can be produced.

**FEDDERS MANUFACTURING CO., Inc.**  
**BUFFALO, NEW YORK**



# The Two Biggest Things in Toledo

**OVERLAND**

**250 CARS DAILY**

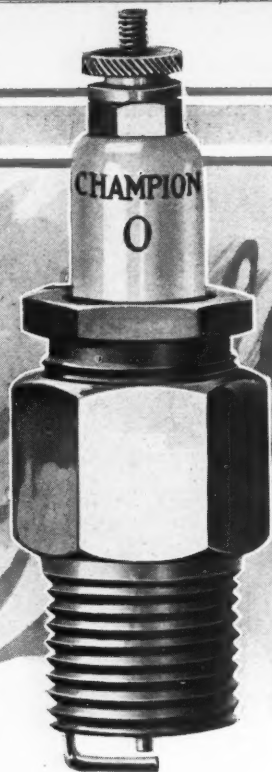
**CHAMPION**

**25 000 SPARK PLUGS DAILY**

Again we call your attention to one of the big users of CHAMPION SPARK PLUGS. The Willys-Overland Company is the second largest producer of motor cars in the world. Their big business has been based upon the high efficiency of their cars, and since no motor can give efficiency without an efficient spark plug, their selection of Champion Spark Plugs is significant.

This is one of a large series of four page advertisements telling about our big users and the wonderful characteristics of CHAMPION SPARK PLUGS.





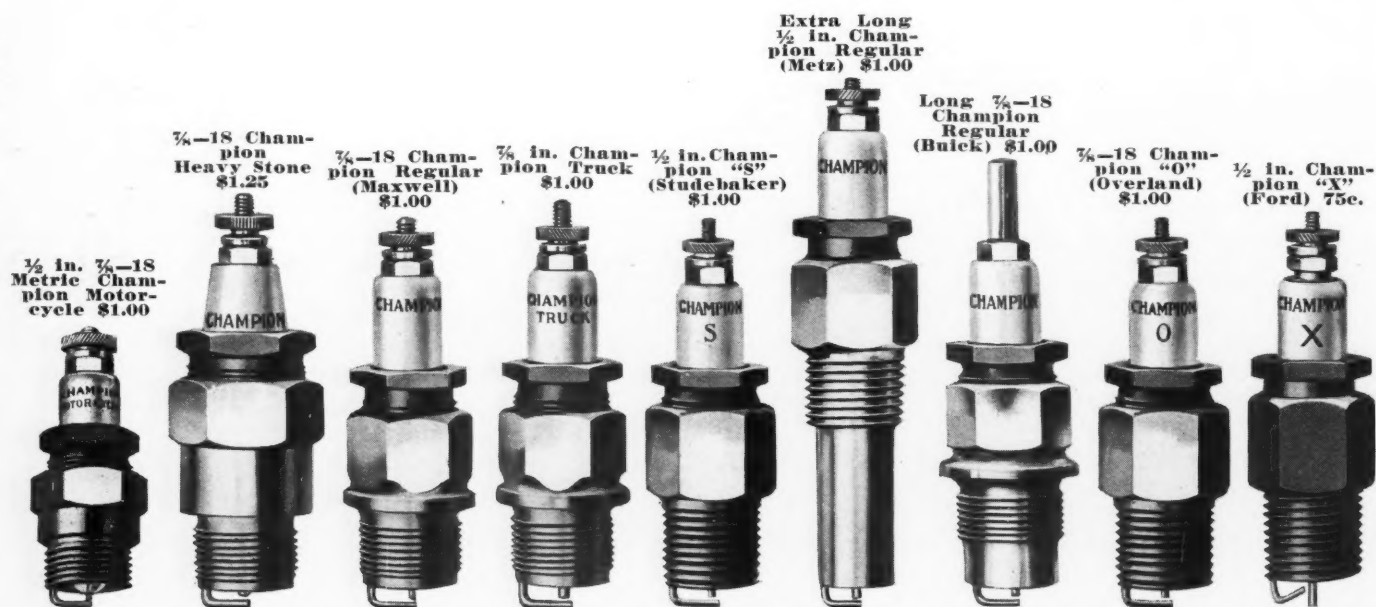
One of the most progressive and surprisingly successful manufacturing organizations in the entire United States is the Willys-Overland Company. In a few years' time they have leaped from the almost unknown to their present dominating position in the industry.

The tremendous Overland reputation would be jeopardized by a single mistake in judgment, and that is why, after the most careful analysis, they selected CHAMPION SPARK PLUGS.

The man who owns an Overland car has confidence in Overland Engineers or he would not have purchased it. Hence, he must have confidence in the Overland CHAMPION SPARK PLUG, the best that the Overland Engineers could select.

The biggest, most important small part on a car is the spark plug. The efficiency of the motor is proportionate to the way this little device does its work.

All Fords, Overlands, Studebakers, Maxwells and forty-eight other well known makes of motor cars are equipped at their Factories with CHAMPION SPARK PLUGS.



# SPARK PLUGS - DAILY

THERE MUST BE SOME VERY POTENT REASONS FOR THE TREMENDOUS SUCCESS OF THE CHAMPION SPARK PLUG.

There are many, and here are a few of them:—

CHAMPION SPARK PLUGS do not fail. The finest equipment of automatic machines purchasable are turning out from solid bars the finished steel shells into which the porcelains are assembled. These shells are so perfectly machined, the porcelains are so truly concentric, and the gaskets made on our own machines are so uniform in thickness and shape that the evenly distributed tension when the spark plug is heated cannot break the core.

The imported manganese nickel spark points used in CHAMPION PLUGS are expensively welded to the electrodes, in order to make the "points that last." We could save \$14,000 a year by doing as some other spark plug makers do, use carbon steel or straight nickel instead of imported manganese nickel. We prefer to spend the extra \$14,000 and make a better plug.

Before a spark plug leaves our factory, it has been subjected to fourteen entirely separate inspections. These inspectors use micrometer gauges of special construction, and the slightest inaccuracy or lack of uniformity in any part is detected long before it reaches the assembly stage.

There are many other reasons for CHAMPION success, which will appear in our future advertisements.

This is the brass knurled thumb nut to which the terminals are fastened.

This is the hexagon steel bushing or lock nut, which is carefully formed to a perfect porcelain seat.

This is the electrode of high conductivity, indestructibly cemented into the porcelain.

This is the porcelain as perfectly turned as a lathe can turn it and prepared to stand the highest heat and most severe shocks without fracture.

These are the copper and asbestos gaskets of special form which absolutely never leak.

This is the imported manganese nickel sparking point welded to the center electrode.

This is the highly finished steel shell, heavy and strong, made to last.

This is the ground electrode of imported manganese nickel immovably fastened in the shell.





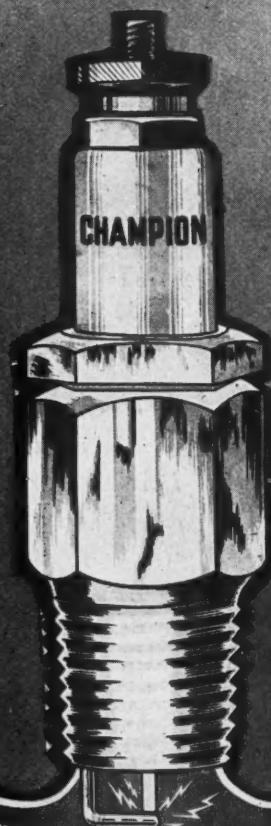
## We Have Three Distinct Methods of Helping a Dealer to Sell CHAMPION SPARK PLUGS

**FIRST:** We make the best plug that we know how, and we believe that it has had more time, attention and engineering skill devoted to its perfection than any other plug made.

**SECOND:** We have spent and are spending a tremendous sum of money in such National mediums as Saturday Evening Post, Collier's, Literary Digest, Popular Mechanics and others, to boost the dealer's sales and bring the car owner into the dealer's store.

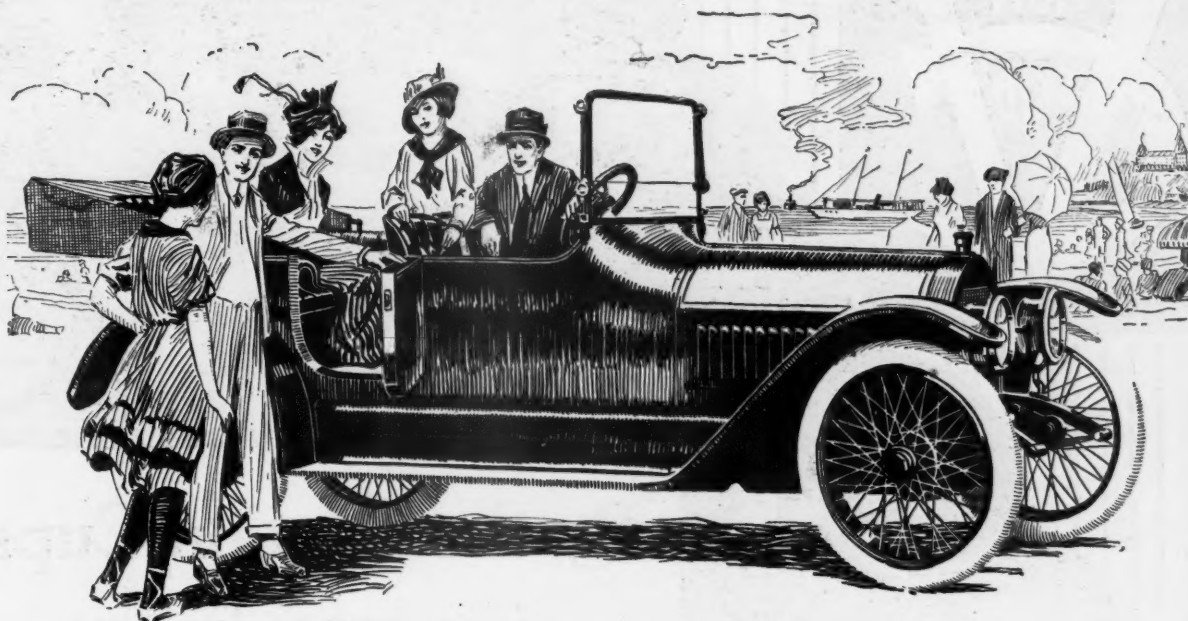
**THIRD:** We have many effective methods of assisting the dealer in displaying our plugs to the best advantage. We have the cards shown on this page, to which six plugs are attached, and which we gladly send to any dealer who orders 100 plugs. This has proved itself to be a very helpful device. We have window transparencies, puzzle cards, metal store signs and many other things with which we link the dealer's store to CHAMPION PLUGS.

We now have over 35,000 distributors of CHAMPION SPARK PLUGS. If you are not among them, you are missing one of the biggest opportunities of the accessory business.



Champion Spark Plug Company, Toledo, Ohio





## Observe These Yacht-like Lines

**M**UCH has been said by car builders about yacht-like lines, but they really never existed—or could exist—with a four-door body. But here they are—sweeping, graceful, unbroken from the bow of the bonnet to “midships.”

The KisselKar two-door body is a greater advance in construction than was the four-door body over the old “open front.”

The introduction of the four-door body accomplished but one thing—it improved the looks of the car.

The KisselKar Two-Door again beautifies the car and at the same time adds infinitely to its comfort and convenience.

Look at those big 26-inch doors and the aisle between the front seats—consider how

these features add to the pleasure of motor-ing. Ample room to get in and out and provision for passing from the rear to the front seats without leaving the car.

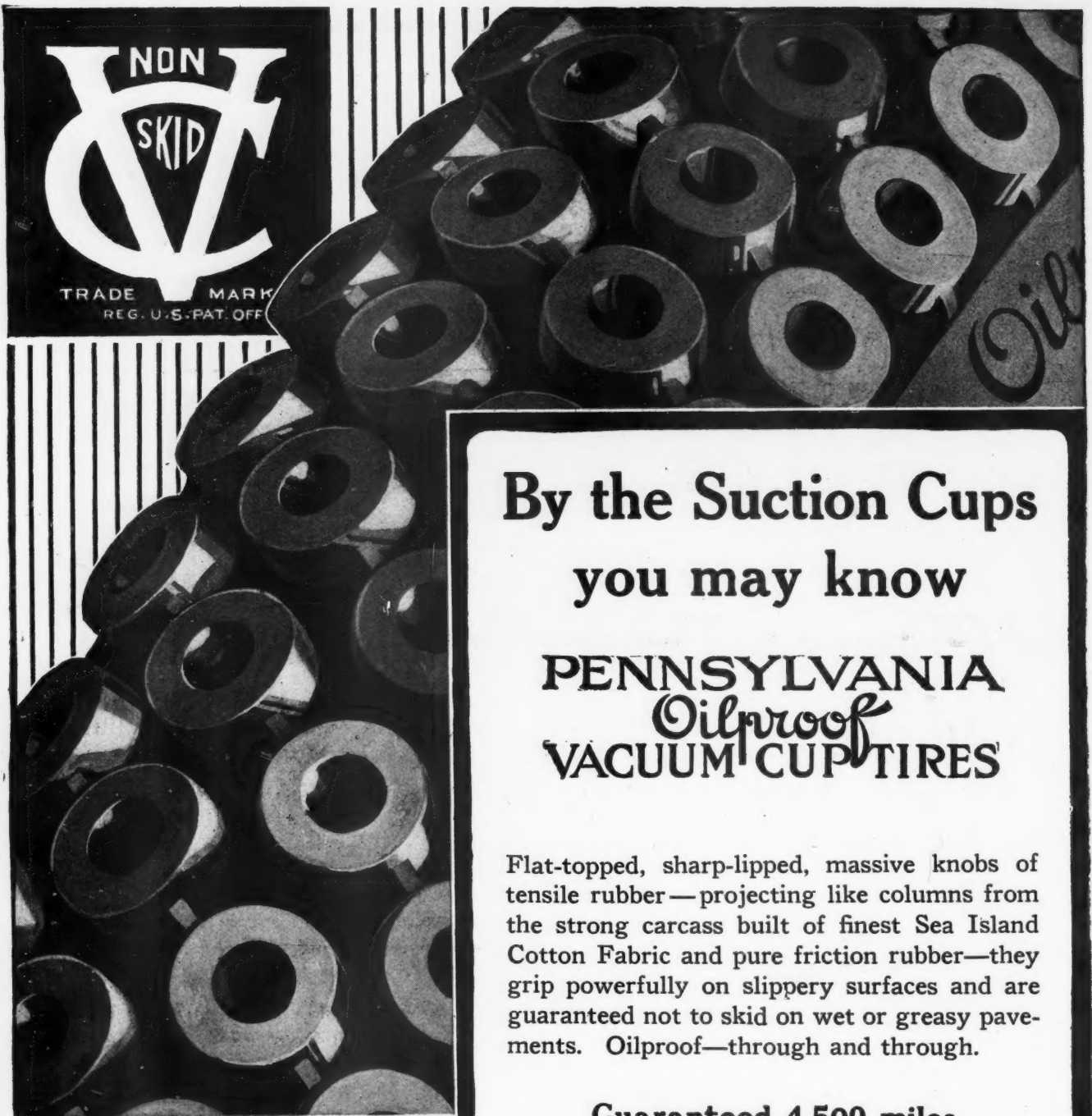
The new 48 “Six” chassis, on which this two-door tonneau is mounted, is mechanically the best KisselKar ever built. Four-door body on this chassis is optional—you can buy either type for \$2350. Wire wheels \$70 more.

**Kissel Motor Car Company, 121 Kissel Ave., Hartford, Wis.**

BOSTON, NEW YORK, CHICAGO, MILWAUKEE, KANSAS CITY, MINNEAPOLIS, ST. PAUL, DALLAS, SAN FRANCISCO, LOS ANGELES, OAKLAND, Philadelphia, Detroit, Houston, El Paso, Washington, Baltimore, Nashville, Duluth, Buffalo, Pittsburg, Hartford, Conn.; New Haven, Albany, Troy, Rochester, Providence, Cincinnati, Newark, Montreal, Quebec, Toronto, Winnipeg, Calgary and 300 other principal points throughout America.

# KISSELKAR

*Every Inch a Car*



**By the Suction Cups  
you may know**

**PENNSYLVANIA  
*Oilproof*  
VACUUM CUP TIRES**

Flat-topped, sharp-lipped, massive knobs of tensile rubber—projecting like columns from the strong carcass built of finest Sea Island Cotton Fabric and pure friction rubber—they grip powerfully on slippery surfaces and are guaranteed not to skid on wet or greasy pavements. Oilproof—through and through.

**Guaranteed 4,500 miles  
—and averaging double**

**DEALERS** should let us have their V. C. orders  
NOW—before the mid-season rush  
prevents our usual prompt service.

**Pennsylvania Rubber Company  
Jeannette, Pa.**

New York  
Chicago  
Cleveland

Boston  
Pittsburgh  
San Francisco  
Seattle

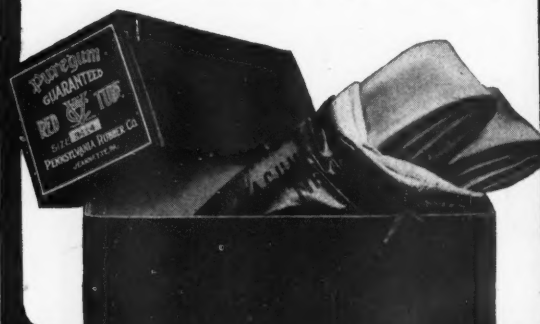
Los Angeles  
Detroit  
St. Paul  
Dallas

Minneapolis  
Omaha  
Kansas City, Mo.  
Atlanta

*An Independent Company with an independent selling policy*

**PUREGUM RED INNER TUBES**

Just what their name implies—absolutely pure rubber with necessary antimony for color and cure. NO MINERAL to make weight or weaken.



# Hupmobile

The car of The American Family

**\$1050**

**Completely Equipped**

With electric starter and lights, demountable rims, oversize tires, \$1200. Prices f. o. b. Detroit.



## You Buy Excess Value

The Hup is excess value in the quality of its engineering and its materials.

Excess value in its low running cost—its long gas and oil and tire mileages.

Excess value in its continuous service.

In its almost total freedom from repair costs through defective or broken parts.

In the smartness of its low-hung, streamline design.

In its reputation, from one end of the country to the other, as a car of extraordinary excellence.

## You Sell Excess Value

As a second-hand car the Hup stands higher than any other.

It brings a better price in any market, at any season.

Because it's a good car after one or two or three seasons of use.

Its steels are better, last longer and wear less.

So it runs as well as when new; it is full-powered and full of "go"; it picks up and gets away as quickly as it ever did.

In other words, Hup depreciation is less per thousand miles.

These are things you want in your car—low running cost, practically no repair cost, high selling value.

You get them in greater proportion in the Hup because of the way it's built.

Ask any Hupmobilst.

**Hupp Motor Car Company, 1228 Milwaukee Ave., Detroit**

*When Writing to Advertisers, Please Mention Motor Age.*



# BUDA MOTOR

## The Part That Sells The Car

The moving parts of a good piece of machinery do not touch each other. They rest on a film of oil. To have all frictional surfaces far enough apart to admit a tiny film of oil, yet close enough together to make a perfect fit means dealing in thousandths and ten-thousandths of an inch. The experience, skill and conscience to do this means "best that can be built." *And that's the kind of motor the BUDA is.* In our plant "approved" means "not susceptible of improvement."

## The Wonderful Buda Six

while no better than the other Budas is especially popular just now owing to the rise of the Six in general. If the salesman who sells you your next car tells you there's a Buda Six under the hood, you can buy with the assurance that NO CAR you'll ever meet (regardless of price) will have a better motor. No such thing exists, and car makers know it. (3½x5½)

### THE BUDA COMPANY

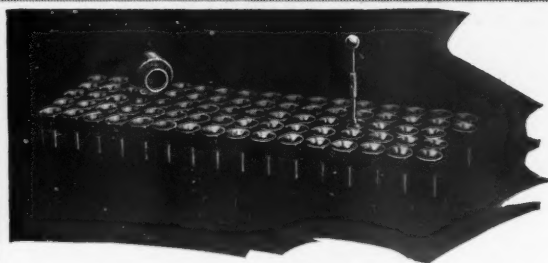
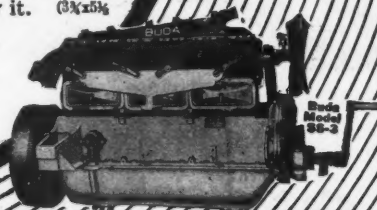
FACTORY, HARVEY ILL., (Chicago Suburb)

Address

### BRANDENBURG & COMPANY

1108 Michigan Avenue, Chicago

57th and Broadway, New York  
Ford Building, Detroit



**B**UILT without valves or springs or cams, the Zenith has no variables. With its compound nozzle and extreme simplicity it can be forgotten when once set correctly. Fool proof and trouble proof—lasting forever—the Zenith is by far the wisest buy in the field of carburetion. Ask for a catalog and get posted.

## Fitting Air to Close Limits

**E**VEN air is measured and held to a standard in building the famous Zenith. The venturi tube or air nozzle is important, for through it must pass the demands of the motor.

These nozzles are quickly tested by the ball gauge. One end of the gauge says "Go" and the other end "No Go"—a difference of but plus or minus 2000ths of an inch. The "Go" end must slip through the nozzle; the "No Go" end must not. Thus even the air which passes through the Zenith must conform to limits. The results obtained from each Zenith are identical. There is no element of chance. All is known.



**ZENITH CARBURETOR CO. DETROIT, MICH.**

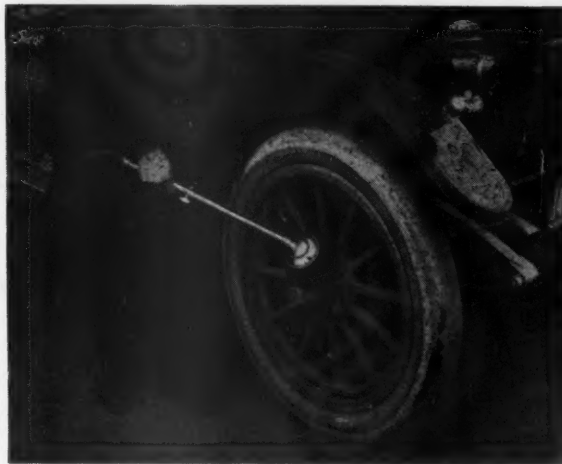
# A MUDDY CAR Has no Terrors for the man who uses the "HICKS" Perfect Fountain Brush

(Patent Pending)

It Washes Your Car without wetting your hands or feet or soiling your clothes.

Never Scratches.

The Water-Cutout in the handle regulates the flow of water.



The Long Handle enables you to reach places you never could get at with a sponge.

Easy to Handle. Just screw on to your garden hose.

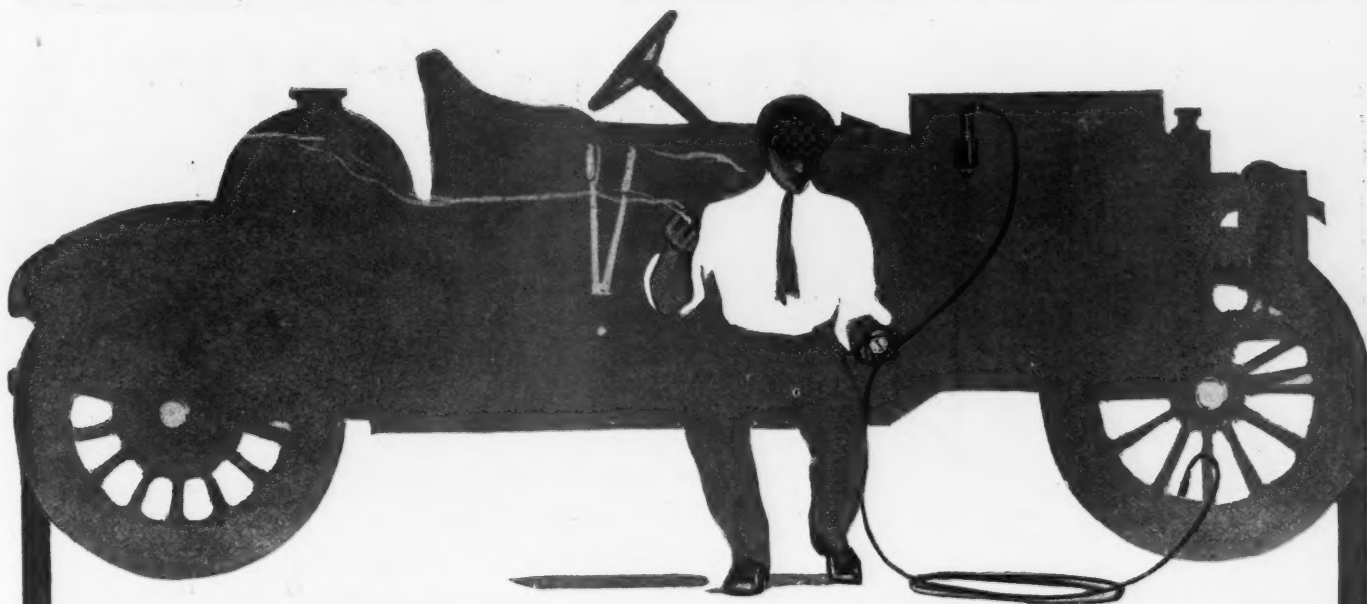
Costs Less in One Year Than Sponges

In United States, \$5.00, Delivered Free

ASK YOUR DEALER

Manufactured by **THE HOWARD W. HICKS BRUSH CO.,** Dept. A

Dealers—Write us for prices 826 Eighteenth Street, Denver, Colorado



Pump your tires the MAYO way. Take it easy on the running board and watch the motor do the work.

Save your tires, your back, your temper. You can inflate your tires five times faster with a MAYO than you can with a hand pump.

rings like a motor, and will last as long. Lowest priced, full-grown pump on the market. Price, complete with pressure gauge, 12 ft. hose, and all connections—

## MAYO SPARK PLUG PUMP

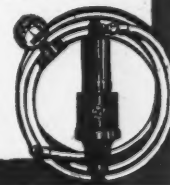
**\$10.00**

MAYO Quick Detachable

Pumps pure, fresh air only. Built with Spark Plug, \$1.50 Extra.



**TRY A MAYO FREE ON YOUR CAR FOR 30 DAYS**  
**MAYO MFG. COMPANY, 55 E. 18TH STREET, CHICAGO, ILL.**





# New Departure Ball Bearings



## A Fair Question Deserves a Fair Reply

**I**N designing your next car, the question of bearing equipment will, of course, receive the serious consideration so important a question deserves.

In all fairness, New Departure ball bearings more than answer that question.

It is a bearing of guaranteed quality, including high grade materials, accuracy of finish, and uniformity of dimension. It is the product of an American factory with ample capacity for prompt and complete deliveries without liability of troublesome delays such as are sometimes experienced by manufacturers who buy their bearings abroad.

Why not give New Departures a thorough tryout?

A line from you will bring our literature and representative. May we send either or both and inform you fully of our proposition?

**The New Departure Manufacturing Company, Bristol, Conn.**

Western Branch, 1016-17 Ford Bldg., Detroit, Mich.



# Model "30"

**Fully Equipped \$1195**



A good, strong guarantee goes with every Glide car.

And this guarantee is backed by a conservatively managed concern of 32 years' standing. Your protection is secure. Glide sales are increasing every year.

The new model "30" Glide at \$1195 has every feature you want and all any one could ask for. It's in the thoroughbred class with the Glide "36" which sells for \$1840.

Dealers: Write for catalogs and proposition.

**The Bartholomew Co.**

215 Glide Street  
Peoria Illinois

*Glide*

### "30" Features

Westinghouse Electric  
Starting, Lighting and  
Ignition System

Unit Power Plant  
Long Stroke  
Motor

Center Control  
Left Side Drive

Gasoline Tank Under  
Cowl Dash

114 in. Wheelbase

Motor Driven Tire Pump  
Floating Rear Axle. With  
Pressed Steel Housing

Demountable Rims

Tire Irons for Extra Tire  
Stream Line Body With  
Concealed Hinges and  
Built-In Windshield



**Business Is Good**

with dealers who are pushing the sale of Gabriel Snubbers, because every set stays sold, makes new enthusiasts and opens the way for other sales.

**Over 3 Times as Many**

Gabriel Snubbers are being sold this year as last, notwithstanding 1913 topped two years of rapidly increasing sales. This is because motorists are now demanding Easy Riding as well as protection to their cars against deterioration.

# GABRIEL SNUBBERS

**Will Help to Sell Your Cars**

**\$15, \$20, \$25 Per Set of Four. Half That Per Pair**



Snubbers retard the upward movement of the springs, preventing abrupt or excessive rebound, the cause of jolts and jars to occupants and mechanism. They keep you on the seat instead of bouncing from it.

Compression of the car springs draws belting into the coil. The moment the springs commence to expand, the layers of belting tighten on the brass friction band within the coil. That friction is what retards upward movement of car body. When springs are at rest there is only enough "pull" on the belting to keep it taut.

**Standard Factory Equipment**

on the easiest-riding cars, White, Stearns, Peerless, Oldsmobile and Lozier. Partial or special equipment on over 20 other leaders.

**On Small Cars**

Snubbers are even more a necessity because of the abrupt rebound and jolts that go with short wheelbase.

**Ask the Engineering Department**

of your car about Snubbers. They have tested Snubbers and know their merits.

**Gabriel Horn Mfg. Co., 1415 E. 40th St., Cleveland, Ohio**

Purchasing an

# UNDERWOOD Typewriter

means

A satisfied operator.

Distinctive Work.

A pleased employer.

And a short day.

## Speed, Accuracy, Stability

Exclusive features, proved by winning every International Contest, stamp the UNDERWOOD as supreme.

# UNDERWOOD

"The Machine You Will Eventually Buy"



## Now You Can Stop That "Chug-Chugging"

### Ford Owners:

You can now make your Ford as quiet-running as the most expensive cars. This latest invention of Hiram Percy Maxim effectively silences the exhaust noise of the Ford motor and adds immeasurably to the pleasure and comfort of motor-ing.

## MAXIM SILENCER FOR FORD CARS

### Makes Your Motor More Efficient—

Thorough tests show that the ordinary muffler creates one-third more back pressure than the Silencer. Back pressure causes the collection of gases in the cylinders. These in turn cause carbon—and carbon lowers the motor's efficiency.

By decreasing this back pressure, the Maxim Silencer increases the engine's efficiency, saves gasoline and makes the Ford quicker-starting and a more powerful hill-climber.

Price \$6.00. Easily attached by any one. Takes the place of the regular muffler. Write direct if your dealer hasn't it.

**Dealers**—Write us at once if you have not yet started to sell the Maxim Silencer. Backed by an extensive advertising campaign, an instant, widespread demand is assured. Silencers for all cars not so equipped regularly by the makers can soon be had. Silencer for Fords are now ready.

Descriptive literature free on request.



**The Maxim Silencer Company**  
6 Colt's Armory Hartford, Conn.

## MAKE \$250.00 A MONTH Repairing AUTO MOBILE TIRES

Sounds like a lot of money — IT IS—A WHOLE LOT of MONEY to be earning CLEAR every month—yet it's what hundreds of men we have established in the Automobile Tire Repair Business are making. You let down the DRAW BRIDGE for SUCCESS to enter into your career by getting into business for yourself. The business for you is the one where investment is small—the returns quick and for cash—where the margin of profit is large—the demand for your PRODUCT or SERVICE constant and ever on the increase.

### A HAYWOOD TIRE REPAIR EQUIPMENT

answers to all of these requirements of Old Dame Fortune—The certainty of success in this business is as sure as anything in this world can be—Each year adds thousands of new Automobile Owners—they need YOU to keep their tires in service.

### Here Is Your Opportunity!

Be first to enter this new, big paying business in your town. Open your pockets. Let the dollars pour in. Act quick. Every auto sold means more tires to mend. Automobile business is growing fast—enormous field for tire repairing. Punctures and blowouts are common. Tires need retreading and vulcanizing. Something going wrong all the time. Thousands forced to buy new tires because they can't get old ones fixed. Think of the old bicycle days—repair shops on every corner—all making money—busy day and night. Autos make same proposition over again—only ten times bigger and better. Users of Haywood Tire Repair Plants are making big money. Johnson, Tex., writes: "I have made as high as \$18 in a day." Another man who bought a plant September, 1911, writes he has cleared over \$3000.00. That's going some! Operate a plant as side line in connection with auto business—garage or as an independent business. Find neighborhood where there's a bunch of autos—get all the steady business besides transient work. Experience unnecessary. You learn quick. Simply follow directions—practice a few days on a couple of old tires and you'll be ready to coin money. Business comes fast and easy.

### Repair Tires At Home

Young men! and boys repair father's tires—get money he pays garage man. Get the neighbor's work. Make money to attend college or to start a garage and repair business.

**Auto Owners**—Repair your own tires—save money—pay for your outfit in short time. We have outfits for home use. Anyhow, investigate. Send today for catalogue. See the wonderful possibilities in this marvelous field. Learn of the enormous money-making opportunities in this fascinating new business.

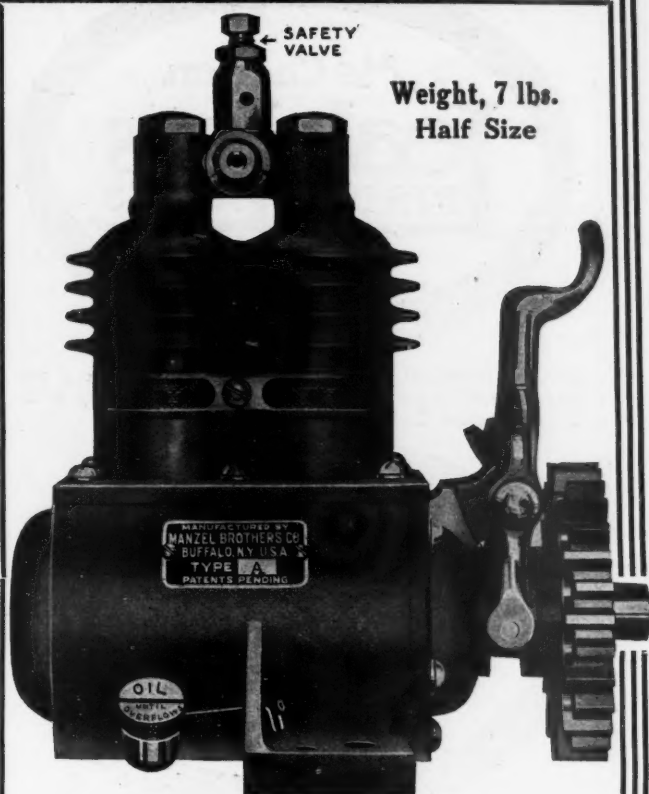
**Haywood Tire & Equipment Co.**  
720 N. Capital Ave., Indianapolis, Ind.

The New Money-Making Business —Start Now—This Man Is Making Money

Business Keeps Coming



Put Yourself Where This Man Is



Weight, 7 lbs.  
Half Size

### A Power Pump is Indispensable on a Modern Car

No car manufacturer would think of selling a worth-while motor car without making some provision for compressed air. Is your car so equipped? If not, you need the

# MANZEL

ENGINE DRIVEN TIRE PUMP

### Do You Carry An Old Fashioned Bicycle Pump In Your Tool Chest?

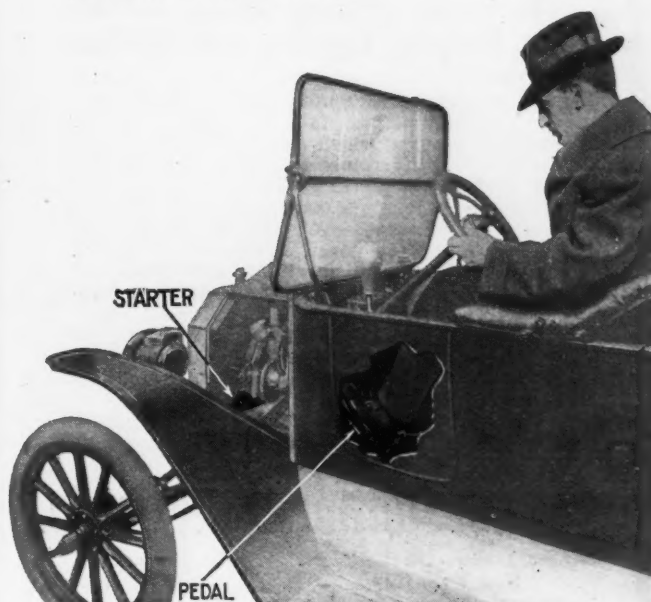
When the warm days come and you feel like getting away from the city, then you can appreciate the satisfaction of having your car equipped with a power driven pump. The MANZEL is the logical purchase, not only because it is the fastest and most efficient pump on the market, but because it is made with fittings adaptable to your car.

The installation of a MANZEL ENGINE DRIVEN PUMP on your car is a simple matter. We carry fittings in stock that make the MANZEL ready for immediate attachment to Abbott-Detroit, Buick, Cadillac, Cole, Cartecar, Chalmers, Hudson, Howard, KisselKar, Maxwell, Mitchell, Oakland, Overland, Packard, Paige-Detroit, Reo, Speedwell, Studebaker, Stutz and other cars.

**Manzel Bros. Company**  
306 Babcock Street Buffalo, N. Y.

## Make Your FORD Complete!

Get this powerful, simple, sure starter—the one that requires no alterations—that abolishes all chance of injury from backfire—the one that sells at the price you can afford.



### Century (Housel) Ford Starter

Just push a foot pedal—and it goes! Turns the engine twice as fast—and you do it from your seat. Even an 18-year-old boy or girl can do it with little effort. Now! everybody in the family can use the car—you don't have to be along to do the cranking. Neither need you fear strained backs or broken limbs—the danger from backfire has been abolished.

Out of sight—under the hood. Easy to install—takes but one hour. Safe—interferes with nothing. In case of backfire releases automatically. Guaranteed against all defects of material and workmanship.

Mr. S. D. Hirschl, Expert and Chairman of Technical Comm. of Chicago Motor Club, says: "The examination and tests I have made convince me it is the best mechanical starter on the market."

THE PRICE  
IS RIGHT

**\$25**

DESCRIPTIVE FOLDER  
FREE ON REQUEST

Only \$25 to make your FORD complete—a bargain price to pay for convenience and safety! Sent on approval on receipt of your check—money back if you are not satisfied. Send for information—better yet, order NOW—and have this real FORD Starter on your car before it is too late!

**Century Foundry Company, Inc.**  
1622 N. SALINA ST. SYRACUSE, N. Y.



**Gould**  
Storage Battery  
**Gould**



*End-to-End Arrangement  
of Cells. Width Only 4 1/2 Inches  
in the Largest Size.*

### The Latest Type of GOULD Battery for Starting, Lighting and Ignition

USERS appreciate the large expansion chambers with threaded caps, which provide a natural funnel on each cell for adding water and which open a straight channel for inserting hydrometer syringe deep enough for a satisfactory test. The neat cover seal absolutely prevents leakage and permits of real internal inspection. Where the pillar posts come through the cover, sleeves of corrugated rubber and surrounded with sealing compound make air and leak-tight joints of sufficient flexibility to withstand strains on the posts.

The active plate material and grids are of the well-known Gould types, assuring uniformly high capacity, low internal resistance and exceptionally long plate life.

Made in standard S.A.E. dimensions and in capacities to meet all requirements.

*Write for Bulletin and Prices*

## Gould Storage Battery Co.

General Offices: 30 E. 42d St.  
New York City

Works:  
Depew, New York

Boston—14-16 Cambria St.  
Philadelphia—613 Betz Bldg.  
Cleveland—1761-5 E. 18th St.  
Detroit—88 E. Congress St.

Chicago—The Rookery  
San Francisco—1448 Van Ness  
Ave.  
Los Angeles—110 E. Pico St.

Agents in  
Washington, Rochester, Buffalo, Pittsburgh, Milwaukee, Min-  
neapolis, St. Louis, Kansas City, Omaha, Denver,  
Topeka, Seattle

CANADIAN REPRESENTATIVE:  
R. E. T. Pringle, Toronto, Montreal, Winnipeg, Vancouver  
Full stock of parts, plates and repairs carried by all  
offices and agents.



*Side-to-Side  
Arrangement of Cells.*

102



By the installation of new automatic machinery we are now able to produce our rings in quantity lots, at a material decrease in cost.



As a result we are making a 20% reduction in the price of our rings to consumers, dealers and jobbers.



By decreasing prices we are increasing sales.



All quotations submitted prior to June 1st are now subject to an extra reduction of 20%. Take advantage of this. Satisfaction guaranteed. Dealers and jobbers wanted. Write.

**McCadden Machine Works**  
St. Cloud Minnesota



## YOU FEEL AT HOME AT THE McALPIN

**Y**OU will be pleased with this hotel from the first moment you enter it. Because the atmosphere surrounding the Hotel McAlpin's unusual comforts is one of marked refinement and cordiality.

Largest and safest of the great hotels of the world—with a noteworthy cuisine—appointments of distinctive beauty and prompt, INTELLIGENT service, the tariffs of the Hotel McAlpin are nevertheless notable in their moderation.

Location and surroundings are ideal. At Broadway and 34th Street—with the Pennsylvania Terminal only a block removed and the Grand Central Station a short distance away—you have only to step from the McAlpin doors to be among the city's greatest shops, theatres and office buildings.

If you appreciate the myriad conveniences of a perfectly appointed hotel your happiest days will be spent at the McAlpin.

Management of MERRY & BOOMER

## HOTEL McALPIN

*Herald Square*

## NEW YORK

*Nearer than Anything to Everything*



# INTERLOCK

## Inner Tires

## Give Satisfaction

The Interlock is EFFICIENT, because it will render you a **real service**. That service is more miles per dollar than you are now getting out of your tires. Interlocks pay for themselves in saving of tire repairs and in increased mileage. This means

## ECONOMY

Interlocks reduce the possibilities of tire trouble to the minimum, thus creating a new pleasure in the use of your car. The Interlock has made good for five consecutive seasons, and is endorsed by thousands of satisfied Users, Dealers and Auto Supply Houses.

The tire shown below was equipped with an Interlock and ran over 10,000 miles without a blow out. The extra strength of the Interlock so reinforced the casing that its full mileage was obtained—i. e. until the tread was **honestly worn** down to the fabric. Then the Interlock was taken out and used in another tire. Every tire should serve you until its tread is worn out, yet statistics show that fully 90% of tires do blow out before the tread is half worn out. Interlocks prevent this big tire waste, not only saving you fully half your tire money, but greatly increasing your pleasure in the use of your car.



### Description

Interlocks are made endless like carcass of a tire.

Have 4 and 5 plies of fabric, vulcanized together in one perfect body. The Interlock, with its integral flaps completely enclose tube, and flaps "lock" under pressure. This takes strain off sides of tire as well as tread, and makes the tire twice as strong. Also prevents rim cuts and tube pinches between the beads. The Interlock has smooth finish inside and out, so won't chafe a tube. Will not over heat or reduce resiliency of tires. You use the same size tubes—Interlocks do not change the qualities of your tires in any way except to make them stronger and last longer. Easy to put in or remove—and they fit perfectly.



### TO DEALERS:

There is satisfaction in handling Interlocks and Double Fabric Accessories because they give satisfaction to the consumer. They are easily sold, and **stay sold**. Write and ask about our dealers' proposition and circularizing plan. A good opportunity for live dealers. Please write us while the matter is fresh in your mind.

## Double-Fabric Tire Company

128 West 11th Street,

Auburn, Indiana



## Charge Your Own Storage Batteries

The St. Louis Battery Charger is designed for charging low voltage storage batteries from an alternating current such as is supplied to the ordinary incandescent lamp.

The Battery Charger converts an alternating current into a direct current. It is very simple in operation.

The plug provided with the Battery Charger is screwed into any convenient lamp socket, the current switched on, and the battery connected.

### St. Louis Battery Charger

The Battery Charger is the simplest device on the market for this service. Its advantages may be summed up as follows:

- (1) It will charge a dead battery in the proper direction.
- (2) It will not harm battery on overcharge.
- (3) It automatically gives the battery a tapered charge.
- (4) It costs little to operate.
- (5) It is small and light.
- (6) It is designed to operate on circuits of wide variation in voltage and frequency.

#### Guaranteed Satisfactory or Your Money Refunded

We guarantee the Battery Charger to give satisfactory service. Should it fail to do so, the customer is privileged to return it to us for credit within thirty days from date of purchase.

Price, for 6-volt, 6-ampere size (without ammeter), to operate from 110 volt, 60-cycle—\$20. Prices quoted on larger sizes on application.

Dealers and Jobbers Wanted Everywhere

### ST. LOUIS ELECTRICAL WORKS

5410 Easton Avenue

ST. LOUIS, MO.

## WESTON Model 301

## Ammeters

for the

Cowl

or

## Dashboard



are specially built with a full knowledge of the exacting requirements of automobile service. They are designed for continuous reliability and like all other Weston Models, are constructed with the most conscientious regard for the service for which they are intended.

Their serviceability, accuracy, and durability is vastly superior to that of any other small instrument and, in fact, their merits are so radical as to place them in a class which is distinctly their own. We should be glad to prove these statements upon request.

There is no better insurance for the automobile, or starting and lighting equipment manufacturers, against dissatisfied owners or expensive claims, than to use Weston Model 301.

It is an extremely high grade yet surprisingly inexpensive instrument.

For information address,

### Weston Electrical Instrument Co., Newark, N. J.

New York	Boston	San Francisco	Atlanta	Berlin and
Chicago	St. Louis	Detroit	Richmond	London
Philadelphia	Denver	Cleveland	Toronto	

Copy contributed by Gleeson Murphy of the H. K. McCann Company, Detroit, Mich.



## For Our "100 Million" Nation

A growth of 7,000,000 in four years has placed the United States in a position where it looms as the true colossus of the modern world.

In colossal achievements it has surpassed the works of antiquity.

In constructive work of all kinds the American nation has taken the lead, holding her Light of Liberty and Peace high above sordid jealousies and selfish desires, setting the whole world a worthy example of true brotherhood and co-operation. Justly we may be proud that we are Americans.

For another great thing is to be done—there is to be a true "Uniting of the Union." A great shining band of brotherhood is to be stretched across the continent, from coast to coast, state to state, city to city, linking the hearts of all true Americans still closer together.

The Lincoln Highway—continuous, connecting, improved—a road of beauty and comfort—Your Way and My Way.

Lincoln could have no more appropriate—no more enduring—tribute.

You can share—you can help in the building of this glorious memorial.

Do it—send five dollars to—

### The Lincoln Highway Association

Dime Bank Building, Detroit, Michigan

Send an additional dollar and get a pair of Lincoln Highway pennants for your car.

#### "WARNER GEARS—STANDARD FOR YEARS"

"It's an absolute impossibility to 'open up' a plant and immediately deliver efficient gear assemblies.

"It takes time and experience—especially experience—to enable a concern to ship really dependable parts.

"This is an undisputable fact, no matter what the business happens to be.

"We are surely capable, in lieu of these facts, as for thirteen years we have been manufacturing automobile gear parts for the most successful and best known motor car manufacturers in the country.

"And listen, what is more, we've been pleasing them in every particular.

"Is there any better proof of a product's merit than one hundred per cent of satisfied customers?

"Looks as if we ought to be able to please you too."

# WARNER GEAR CO. MUNCIE-IND.

DETROIT OFFICE—678 FORD B'L'D'G.





# I Multiply Your Business

—E. Z. Rider

Mr. Dealer, I want to come and work for you!! I multiply sales, and if you'll give me a chance I'll bring you business—big business.

Just as soon as I get onto a Ford I begin to talk—and I keep on talking. I make the Ford ride so easy that the owner becomes enthusiastic at once. And he begins to talk E. Z. Rider Shock Absorbers to other Ford owners. That's the way I multiply business for the Dealer. One set in use sells another—and another—and many others.

**E. Z. Rider Self-Adjusting Ball and Socket Joint \$15** Set of Four

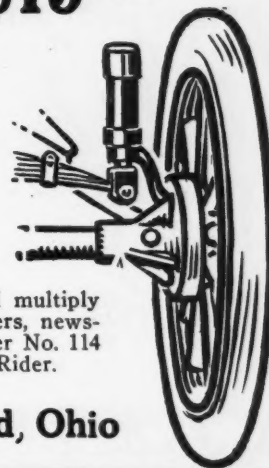
This is a special and exclusive feature of E. Z. Rider Shock Absorbers. The Ball and Socket Joint gives free and easy action of the springs.

It insures a straight pull at all times and prevents binding. This special feature with the high quality makes E. Z. Rider the Superior Shock Absorber. E. Z. holds the springs in exactly the same position as Ford Spring Brackets.

## Sales Helps for Dealers

Dealers, send in your order today and let me show you how I multiply business. Special sales helps free—outdoor signs, advertising folders, newspaper advertisements, cuts and moving picture slides. Ask for Folder No. 114 and special dealers' proposition.

—E. Z. Rider.



**The Forest City Electric Co., 5014 Windsor Ave., Cleveland, Ohio**

Is your car costing too much?

Is your tire mileage too low?

Do you wonder why so much gasoline is necessary?



Are your repair bills high?

Do you know what your gross cost per mile is?

Do you wish to run your car as you do your business?

## THE AUTOMOBILE EXPENSE RECORD

solves all these problems quickly and accurately.

With the co-operation of the motorist this record classifies every item of expense—records the miles traveled—shows the mileage yielded by each gallon of fuel and oil and by each tire. It provides a ready means for determining whether gasoline is giving the proper mileage—whether tires are wearing abnormally and finally gives several pages of cost cutting recipes, any one of which should repay, one hundred fold, the cost of this little book and time spent in keeping it.

Do you know when you last used a decarbonizer? You frankly admit that your car may be ruined in a ten mile ride because of lack of lubrication, but how do you keep track of your lubricant? When did you last screw down your grease cups? When did you load up your transmission and differential with lubricant? Time flies—the memory is treacherous. It may seem to you that it was done a week ago when in reality it was a month or more. The AUTO EXPENSE RECORD provides pages on which these things may be carefully recorded that no lapse of memory may ruin your car or decrease its power to serve you well and inexpensively.

Keep a record of expense of every trip, in space reserved for this purpose.

Price \$1.50 Postage prepaid

CLASS JOURNAL CO. 910 S. MICHIGAN AVENUE CHICAGO, ILLINOIS

(24)



No. 203



No. 216



No. 204



No. 205



No. 200

## "PRESTO" CIGAR LIGHTERS AND INSPECTION LAMPS

No. 200 Combination Cigar Lighter and Trouble Lamp. Price, \$3.50. No. 202 Presto Cigar Lighter and Holder. Price \$2.75. No. 203 Presto De Luxe Cigar Lighter, complete with interchangeable cigar lighter tip and electric light bulb, and nickel-plated holder. Price \$4.50. No. 204 Presto Ford Watch Type Cigar Lighter. Price, with holder, \$2.50. No. 205 Presto Star Watch Type Cigar Lighter for all other make cars. Price, with 8-volt lighter tip and holder, \$2.50. No. 216 Inspection Lamp with 1/2 reflector and adjustable hook hanger. Price \$1.00. No. 240 Automatic Cord Winder, adaptable for use with any Presto device. Price, \$2.50. No. 627 Ford Dash Lamp. Price, \$1.10.

All devices requiring it come complete with 10 ft. silk cord. All Cigar lighters have guaranteed pure platinum tips. They last—others don't. State battery voltage in ordering.

Order Through Your Jobber or Dealer.

METAL SPECIALTIES MANUFACTURING CO.

736-738

W. Monroe St. Chicago, Ill.

Eastern Office 1779 Broadway New York City



No. 627



No. 240



A New England Expressman's Profitable Chase Equipment.

## "Hard Buyers" Won't Accept Promises

**T**O them you've got to deliver the goods. Therefore, why waste time trying to sell trucks with promises—hard salesmanship?

"Hard buyers" buy Chase Motor Trucks because you can produce the goods to make the sale with, i.e., *Owners' Experience*.

The Chase Dealer Book gives you Owners' Experiences with Chase Trucks in all lines of business, under all conditions; put down in black and white and signed by the owners.

It shows a buyer exactly how much to expect. It gives him the only safe basis to buy on. It explains why 3,600 Chase Trucks have been bought and used with success by Hard Buyers.

Five efficient Chase models, 1,000 lbs. to 3-ton capacity, \$750 to \$3,300. Write for information regarding open territory. Address Dept. 5,

CHASE MOTOR TRUCK CO., SYRACUSE, N. Y.

BUILDERS OF

## CHASE MOTOR TRUCKS

Operating between  
Detroit and  
Buffalo



## "Two GIANTS of the Great Lakes"

Str. City of Detroit III  
Str. City of Cleveland III

### The Delights of a Lake Trip

**R**EST after work is necessary to human endurance, and holidays are a wise economy. The Great Lakes of America offer more vacation opportunities than any other source in the country. The steamers of the Detroit and Cleveland Navigation Company operating to all important ports are unrivalled in point of elegance, comfort and quality of service—the perfect freedom offered by the saloon and promenade decks, the commodious state rooms, luxurious furnishings and excellence of cuisine make life aboard these floating palaces a solace to the weary mind and body.

### Where You Can Go

Daily service is operated between Detroit and Buffalo, Detroit and Cleveland; four trips weekly between Toledo, Detroit and Mackinac Island, the historic summer resort of the North Country; and from June 25 to Sept. 10 a special steamer, two trips weekly, will be in commission between Cleveland and Mackinac Island, stopping only at Detroit every trip. During July and August special daylight trips between Detroit and Cleveland. From June 10 to Sept. 10—daily service between Toledo and Put-In-Bay.

### Railroad Tickets Available

Tickets reading via any rail line between Detroit and Buffalo, Detroit and Cleveland will be honored for transportation on D. & C. Line Steamers in either direction. Send 2 cent stamp for illustrated pamphlet and Great Lakes Map. Address L. G. Lewis, G. P. A., Detroit, Mich.

### DETROIT & CLEVELAND NAVIGATION CO.

Philip H. McMillan, Pres. A. A. Schantz, Vice-Pres. and Gen. Mgr.  
General Offices, Detroit, Mich.  
Steamers arrive and depart from Third Avenue Wharf, Detroit.



SHIFT  
THIS LEVER  
FORGET THE  
WEATHER

The adjustment for varying speed and load is formed in the air and needle-valves of a

## Motsinger Carburetor

They are cut from solid metal, and cannot change or vary. Temperature changes the adjustment of all carburetors. This ONE and ONLY adjustment for temperature on the steering-post enables the driver to keep a perfectly adjusted carburetor from January to September, without a change of needles, nozzles, or air-valves. Temperature is the foe of economy.

You are not interested in the economy obtained by experts on a three adjustment carburetor. Send for letters from our customers showing what you, YOURSELF, can get on your car.



## Motsinger Device Mfg. Co.

885 Putnam Street

LAFAYETTE, IND.

## Don't Accept a "Just As Good"

argument from the dealer; always insist on the genuine

### LOOK FOR THIS MARK

It's your guide against substitution.

## The V-Ray Spark Plug

shown is our "MIKA" type, core being composed of specially treated best white East India mica. All mineral deposits culled out. The Flinting Process renders it

Positively  
Impervious  
to Heat  
and Oil

Think  
what  
this  
means  
when  
used  
in an  
air-  
cooled  
motor

All  
other  
4 point  
plugs are  
imitations

All Dealers  
All Jobbers

Porcelain

\$1.00

"MIKA" \$1.25

All V-Ray  
Plugs  
are sold  
with a  
guarantee  
to give

**MORE POWER  
ON LESS GAS**

For sale at all dealers and  
jobbers, who wish to serve  
you best.

**The V-Ray Company**  
Marshalltown, Iowa



**"Keep  
On Going.  
Bill. I'm Coming  
All Right"**

**W**ORRY about "getting home" doesn't bother the man whose car carries a Basline Autowline. Skidding, engine friskiness or tire troubles won't leave him stalled for long. He's ready to take a tow, or give one, any time.

Autowline is about 25 feet of  $\frac{1}{4}$  inch steel wire rope, same name and quality as famous Yellow Strand Power steel that helped dig Uncle Sam's big Panama ditch.

## Basline Autowline

**"The Little Steel Rope with the Big Pull"**

weighs but  $4\frac{1}{4}$  pounds. Coils under cushion or stows away anywhere. Pulls a 4000-lb. car up a 20% grade. If a tree or pole is handy to hitch to, Autowline will pull a car out of hole or rut on its own power.

All accessory dealers handle Basline Autowline. Price, east of Rocky Mountains, \$3.95. Get one and be ready for what's coming.



**FREE** Illustrated Autowline circular. Write for it

**Broderick & Bascom Rope Co.**

813 N. Second Street St. Louis, Mo.  
New York Office, 76 E. Warren St.

Manufacturers of famous Yellow Strand Wire Rope, the rope with one yellow strand but no yellow streak

# HERZ PLUG

**"BOUGIE MERCEDES"**



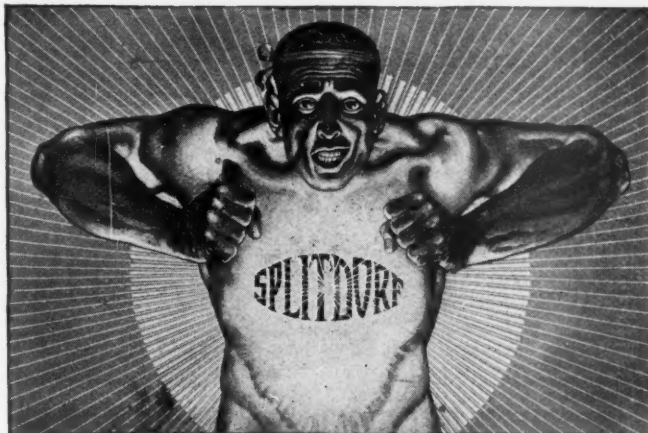
**20 YEARS  
OF SUCCESS**

**GUARANTEED  
ONE YEAR**

HERZ PLUG, costing but a trifle more at first, costs a great deal less at last, because it stands up.

DEALERS—Handsome posters, showing the above figure in full colors, will be sent on request

HERZ & CO. 245 W. 55TH ST. (n.r. Bway) N.Y.



**SPLITDORF MAGNETOS**—low and high tension—are made in a wide range of models for all manner of work and they'll give your motor more power—make your motor run smoother and quieter than will any other make, and, equipped with one, you can always start your engine on a quarter turn.

We'll exchange your present magneto of any make on a liberal allowance basis for an up-to-the-minute SPLITDORF low or high tension.

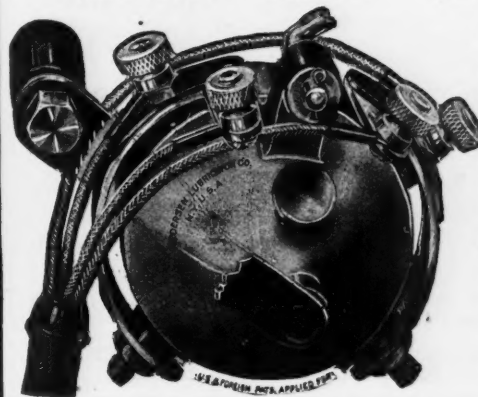
**SPLITDORF PLUGS** are not experimental—they are standard. Known since their first appearance as the "common sense plug" they are exactly that—no more and no less. SPLITDORF PLUGS will outlast your motor—thousands are rarely removed from a cylinder head. There is nothing fanciful about them—they are made to endure any and every strain of ignition put upon them.

**SPLITDORF ELECTRICAL CO.**

98 Warren Street

NEWARK, N. J.

## Pedersen "United" Terminals



A convenience and trouble saver which should be used on the timer of every FORD Car.

This very practical device is made of two stamped brass pieces, provided with insulation fibre, easily attached to timer and bringing all the terminals on top of the timer. This prevents them becoming oil soaked with consequent short-circuiting, also twisting and straining at their connections.

Price 50c by mail post-paid

**PEDERSEN  
HANDY  
GASOLINE  
TURN-OFF**  
75c

**THE  
"STAY-ON"  
BELT  
HOLDER**  
50c



**OIL YOUR "FORD"  
FROM THE SEAT**

Install a Pedersen Lubricator on your car and make it last for years. It saves you money, trouble and worry. Ask your dealer or write

PRICE, \$15.00

**THE PEDERSEN LUBRICATOR CO.**

412 E. 37th St., New York City

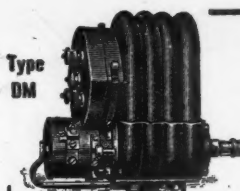




TRADE MARK REGISTERED IN  
**NON-FLUID OIL**  
UNITED STATES PATENT OFFICE

More satisfactory and economical than ordinary grease for wheel bearings.  
**NON-FLUID OIL** does not melt in hot weather—nor leak from bearings onto spokes and tires and accumulate dust of the road—nor rot the fabric. Feeds instantly, saving power, loss and excessive wear. Lasts three to four times as long as ordinary grease—a saving of lubricant and of money.  
"K No. 000" is the correct grade for all ball and roller bearings, grease cups and differential. Get a can to-day. Avoid imitations—be sure above trade mark is on the can you buy.

**NEW YORK & NEW JERSEY LUBRICANT CO.**  
165 Broadway, New York 1430 Michigan Ave., Chicago

**HEINZE**

The performance of **HEINZE IGNITION APPARATUS** for the past ten years justifies our claim that our product is superior in both points of construction and efficiency.

**HEINZE ELECTRIC COMPANY**

SALES OFFICES—DETROIT, MICHIGAN.  
FACTORY—LOWELL, MASS.

Service Stations—New York, Detroit, Chicago, Kansas City.

**Dayton Airless Tires****IMPORTANT NOTICE**

When you order Dayton Airless Tires give the exact weight of car or the make and model.

Each size of these tires is made in several carrying capacities. This permits us to suit the riding quality to the weight of your car. This great advantage is found in no other tire. Attention to this detail will give you comfortable service and economy.

**The Dayton Rubber Mfg. Co.**  
1005 Kiser St., Dayton, Ohio.

NEW YORK  
Retail Branch  
1851 Broadway

CINCINNATI  
Retail Branch  
1932 W. 8th St.

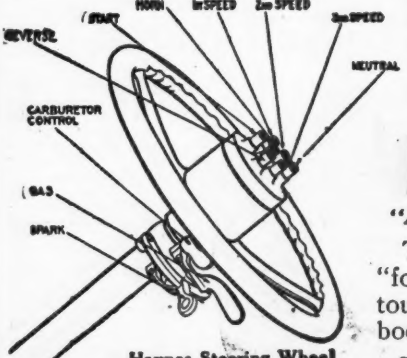
CHICAGO  
Retail Branch  
2123 Michigan Ave.



THINK THOUSANDS OF MILES  
AHEAD, AND YOU WILL BUY  
**REPUBLIC MILEAGE**  
PLAIN AND STAGGARD TREAD  
**TIRES**

**THE REPUBLIC RUBBER CO.**  
YOUNGSTOWN, OHIO.

BRANCHES AND AGENCIES IN THE PRINCIPAL CITIES.



**Electricity Shifts the Gear on the**  
**HAYNES**  
"America's First Car"

Two "sixes" and a "four." Roadsters, touring and enclosed body cars.

Catalog covering this season's models upon request.

**Haynes Steering Wheel Showing Selector Switch**

**The Haynes Automobile Co., 2 Main St., Kokomo, Ind.**

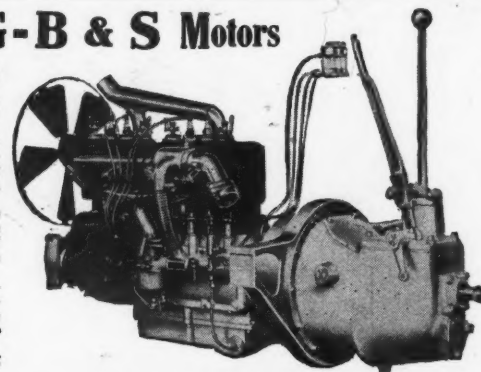
**Motors G-B & S Motors**

We beg to announce our latest four cylinder Unit Power Plant.

This Motor includes the recognized engineering practice, here and abroad.

"Craftsmanship of long experience is the result of this distinctive Power Plant."

Detailed information on request, and we are in a position to make prompt deliveries according to contract.



**GOLDEN, BELKNAP & SWARTZ CO.**  
DETROIT, MICH.



**Braender Tires & Tubes**

**SERVICE and SATISFACTION**

The Only set of Tires to complete the entire 500-mile race at Indianapolis, May 30, 1913. Consider that 88 Tires of other makes were changed in this Race. Our "Victory Folder" explains other races.

**Braender Rubber & Tire Co.**  
Main Office & Factory Rutherford, N. J.

New York, 1937 B'way. Chicago, The Alfredal Co. Boston, Dayton Tire Co. Pittsburg, Keystone Motor Supply Co. Indianapolis, Brant Bros. Columbus, O., Franklin Rubber Co. Troy, N. Y., G. H. Snyder. Newark, N. J., Ketcham & Lawrie.

Established Agents Solicited

**COMFORT**

—Perfectly easy, soft, luxurious riding over any road, at any speed, on **Detroit Springs**. Guaranteed two years. Write for book.

**Detroit Steel Products Co., 2260 E. Grand Blvd., Detroit, Mich.**

You can know these springs by this trade mark →

**RESILIENT**  
**Detroit Springs**  
SILENT—SELF-LUBRICATING

## Coxajusto

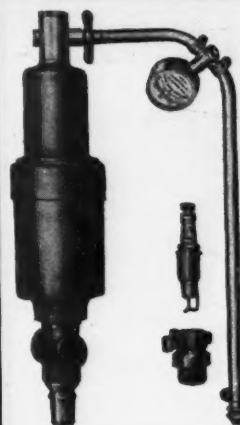
ADJUSTABLE TO ANY LOAD

the shock absorbers that have made good on heavy and light cars alike. The adjustment feature found only on Coxajustos is the reason for their superiority. A simple twist of the wrist adjusts them to the load. There is a model especially for the Ford.

Send for Folder Today. Address Dept. A.

**Cox Brass Mfg. Co., Est. 1872 Albany, N. Y.**

1777 Broadway, New York City. 2837 Michigan Ave., Chicago, Ill. 870 Woodward Ave., Detroit, Mich. 1216 Van Ness Ave., San Francisco, Cal. 899 Boylston St., Boston, Mass. Export Representative, Auto Supplies Export Co., 1779 Broadway, New York City.



## The Brown Impulse Tire Pump

can't jam or get out of order.

Completely equipped with tire gauge, Brown Co., Q. D. Spark Plug, self opening valve connections and air hose.

The most substantial tire pump on the market—the most convenient to use. The only one that's fully equipped—won't overheat and stick in the cylinder.

\$15.00 pays for all. Extra Brown Co. Q. D. spark plugs \$1.00. Your old pump made over and new plug furnished \$1.50.

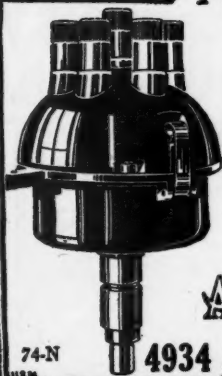
Ask your dealer or write us.

**The Brown Company**

120 Bellevue Ave.

Syracuse, N. Y.

## The Atwater Kent Ignition System



For every kind and make of motor. A system ideal in efficiency, simplicity, and reliability.

Write today for booklet A.

**ATWATER KENT MFG WORKS**

74-N

4934 Stenton Ave., Philadelphia.



## Steel Protectors

Each section 2 in. wide,  $\frac{1}{8}$  in. thick. They hook to rim. As flexible as ever. Anti-Skid, Can't Blowout or Rim Cut.

How can the rubber wear off if it is covered with steel?

Try 2 or 3 sections over any old blowout

Special prices to the first in new territory

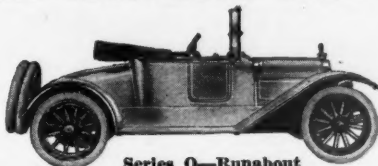
**Kimball Tire Case Co., 179 Hwy. Council Bluffs, Ia.**



Tire covered complete

# MERCER

AMERICA'S FIRST GRAND PRIZE WINNER

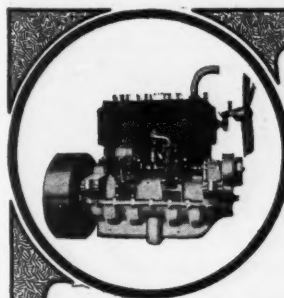


Series O—Runabout

A runabout for the man who demands more in power, speed and comfortable riding qualities than the smaller type of two-passenger car can give.

Send for Catalogue

**MERCER AUTOMOBILE CO. 800 Whitehead Road TRENTON, N. J.**



## Continental Motors

4 and 6 Cylinder Types

Not made to meet a price, nor to shatter records of quantity, but to fulfill a service ideal—to be a true

foundation for a worthy motor vehicle.

**Continental Motor Mfg. Co. Detroit, Mich.**

Factory Representative, K.F. Peterson, 1223 Mich. Ave., Chicago



# Corcoran Lamps

GAS, OIL, AND ELECTRIC

CORCORAN LAMP CO. CINCINNATI, OHIO

# PAIGE

Model "36" \$1275.00

A car whose design and construction is so far ahead of others at its price that it is in a class all its own.

Gray and Davis Electric starting and lighting equipment, silent chain cam shaft drive, four inch by five inch motor, cork insert multiple disc clutch, 116 inch wheel base, left side drive, center control, and equipment complete to the last detail.

Model "25" \$975.00

Including Electric Starting and Lighting System

This model has made the Paige reputation. Such a sturdy, powerful, comfortable car has never been offered the public at anywhere near its price. \$975.00 with complete equipment.

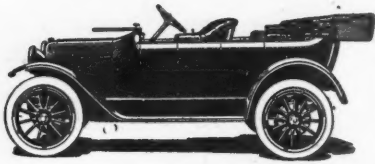
Splendid Agency Proposition

**Paige-Detroit Motor Car Co., 304 Twenty-First St., Detroit, Mich.**



## The *Detroit* — A Complete Line \$850 to \$1050

Five  
Passenger  
Touring  
Car



32 H. P.  
Long  
Stroke  
Motor

Enclosed Valves, Three Point Suspension, Unit Power Plant,  
Platform Rear Springs, Full Floating Rear Axle, Left  
Hand Drive, Center Control, Drop Frame, Large  
Tires, Complete Ball Bearing Car.

BRIGGS-DETROITER COMPANY, 455 HOLBROOK AVE., DETROIT, MICH.

WRITE FOR SPECIFICATIONS

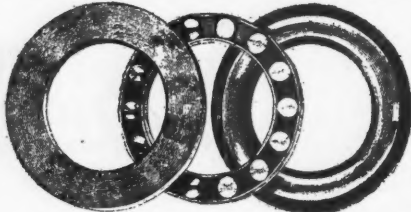
## Wiard Famous Automatic Speedler

The greatest gasoline saver yet invented cuts down bills from 25 to 40%. Easily installed. Price \$4.00. Saves \$50 yearly. For automobiles, motor trucks or motor boats.

### New Wallace Ford Car Shock Absorber

Takes the rough out of roads. Quickly applied. Absolutely efficient. Price \$10.00 per set of four. Sold direct or through your dealer.

**BRESLER-WALLACE SALES CO.**  
1031 Dime Bank Bldg. Detroit, Mich.



COMPLETE THRUST BEARING



RADIAL RETAINERS

**The Star Ball Retainer Co.**  
Lancaster, Pa., U. S. A

Manufacturers of Radial Ball Retainers, Thrust  
Ball Retainers, Complete Thrust Bearings



**AXLES WHEELS  
PROPELLERS**

Salisbury Wheel  
& Mfg. Co.  
JAMESTOWN, N.Y.

TOURING CAR \$850

SPEEDSTER \$750

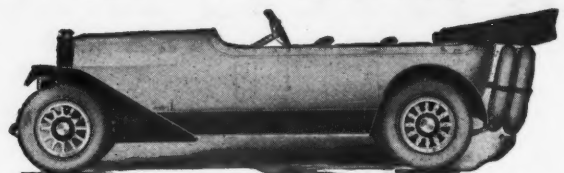
**The Vulcan 27**  
"The World's Greatest Light Car"

1914 is to be the year of the Light Car—the low upkeep car—the VULCAN.

Send for catalog and generous dealers' proposition.

VULCAN MFG. CO., Painesville, Ohio Lock Box MA477

## THE RICHARD



96 Horse Power

80 Miles an Hour

Rated at 25 horse power—develops 96 horse power. Four cylinders, 4 inch bore and 8 13/16 inch stroke; 7 passenger; \$1,850, fully equipped.

Live Dealers Wanted

WRITE FOR OUR PROPOSITION

THE RICHARD AUTO MFG. CO., 1032 ENGINEERS BLDG., CLEVELAND, OHIO



**What the Moore  
Multiple Exhaust  
System Means to You**



By this system, exclusively our own, you gain 22.8 per cent more power with the same amount of fuel. Great economy and more power when you want it. No back pressures in the exhaust manifold. The clean incoming gas is undiluted.

**THE LEXINGTON-HOWARD CO.**

120 Main Street

Connersville, Ind., U. S. A.

**“Bridgeport”**

TRADE

MARK

**TIRE PUMPS**

Are easy to use and easy to sell. They are durable and efficient—and are widely advertised. The cylinders are of seamless brass tubing which cannot rust. The “Stapley,” the “Aeolus,” “Windjammer,” etc., gives lasting satisfaction. Carry them in stock.

**Bridgeport Brass Company**

P. O. Box A

Bridgeport, Conn.



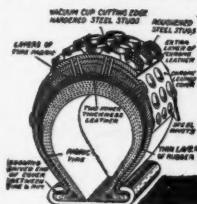
## Bricton Pneumatic Tires

At last the pneumatic tire problem has been virtually solved—the weak points in previous tire construction have been eliminated. The resiliency of a Bricton Pneumatic Tire puts it in a class by itself. It is Puncture-proof — Blowout-proof — Skid-proof — Rut-proof — Rim-cut proof — Oil-proof and Gasoline-proof.

### Ten Days' Free Trial

To remove all doubt that might arise in the purchaser's mind and to back up our statements—we will allow 10 days' free trial on the first set that goes into each town.

**Your Tires Can Be Made Like This** ➔



If you are not in need of new tires and the fabric in your present tires is still good—we can rebuild them the Bricton Way—making them Puncture-Proof, Non-Skidding, Blowout-Proof, Rut-Proof, Oil-Proof, and Rim-Cut-Proof. Write today for full particulars, giving your dealer's name.

**THE BRICTON MFG. CO.**  
1264 Bricton Bldg.,  
Brookings, So. Dak., U. S. A.



10,000  
Mile  
Written  
Guarantee.  
With every  
Bricton  
Heavy Special  
Tire there goes a  
10,000 mile  
written  
guarantee  
which in  
itself  
proves  
their  
merit

## Perfection Auto Starter

Simple  
Efficient  
Durable



For  
Ford  
Cars

Note  
the Compact  
Neat  
Appearance

Operates from the seat. A light push of the lever with the foot, and

### The Engine Starts at Once ITS UNIVERSAL USE

Is due entirely to its success. Every time you try to start your Ford Car the old way, you take a chance of doing yourself bodily harm. The Perfection Starter is a mechanical device which we guarantee to start your engine

### Quickly—Easily—Safely

No gas to explode; no batteries to charge; no springs to wind up, and no upkeep expense. Neat, simple and out of the way.

The installation of a Perfection Starter will make your auto pleasures complete. Catalogue and booklet, with full instructions for installation, sent upon request. Complete installation \$25.00, anywhere in the United States. Don't wait. Write at once.

**THE PERFECTION AUTO STARTER CO., 15518 Broadway, Denver, Colo.**  
EXCELLENT AGENCY PROPOSITIONS OPEN

## Prest-O-Lite is the most ECONOMICAL Lighting System

All the Facts on  
All lighting systems  
mailed you on request

**The Prest-O-Lite Co., Inc.**  
233 Speedway Indianapolis, Ind.  
(Contributor to the Lincoln Highway)

**GEARLESS TRANSMISSION**

# Cartercar

**SMOOTH—QUIET—POWERFUL**  
**Model 7, \$1250**  
Other Models \$1600, \$1700, \$1900, \$2000  
Write for full particulars and catalogue  
**Cartercar Company** Pontiac Michigan

## MASTER CARBURETOR

"You Never do Adjust it—But Always You can Trust it"

Many who have studied CARBURETORS and are familiar with the construction of those in general use, know of their many imperfections. Countless parts are embodied in their construction and, furthermore, it is almost impossible to effect adjustments which will produce the expected results.

Address Dept. J for Full Information

**MASTER CARBURETOR COMPANY, Inc.**  
Factory and Office, 922 S. Los Angeles St., Los Angeles, Cal.

**Ford**  
THE UNIVERSAL CAR

Model T. Runabout .....	\$500
Model T. Touring Car....	550
Model T. Town Car.....	750

With Full Equipment f. o. b. Detroit.

**FORD MOTOR COMPANY**  
Detroit, Michigan

**HAMLIGHT**

## HAM'S

**OIL POT INSIDE**

### STEEL MOTOR TRUCK LAMPS

Ham's Motor Truck Tail Lamp, Model No. 120

**C. T. HAM MFG. COMPANY**  
Rochester, N. Y.

"Pass Them All"

# Knox

**BEST BY TEST**

## Motor Cars

Send for Pleasure or Commercial Catalogue  
**KNOX MOTORS CO., SPRINGFIELD, MASS.**

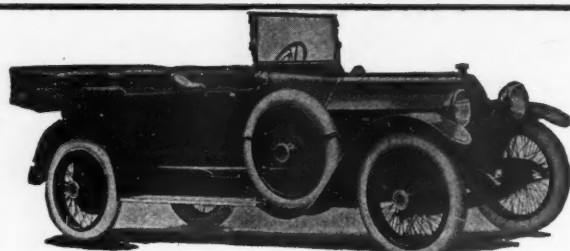
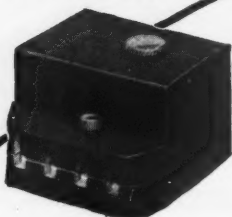
## Your Lighting System

regardless of its name will be benefited by the use of a

## WARD LEONARD Controller

This small automatic dynamo controller also contains the automatic switch that connects to and disconnects from the battery. This controller will operate sparklessly with any low voltage automobile dynamo and maintain a constant predetermined dynamo output. Complete data upon request.

**WARD LEONARD  
ELECTRIC CO.**  
Bronxville, N. Y.



### BENHAM SIX

Continental 6 P motor, 48 H. P. Bosch Ignition. Brown-Lipe 4 speed forward transmission. Spicer Universal joints. Timken full floating rear axle. Timken front axle with Empico speedometer drive. Timken bearings throughout. Long radiator. One man top. Gemmer steering gear. Left drive, center control. Goodrich tires, 34 x 4 1/2. Electric starting, generating and lighting. 130-inch wheelbase. 3,600 lbs.


Two pass., \$2485; Five pass., \$2485; Seven pass., \$2535  
**BENHAM MFG. CO.,** Detroit, Mich.

Safety when you need it  
Low-cost mileage always

## GOODRICH SAFETY TREAD TIRES

*The tread that makes the brake effective*

**The B. F. Goodrich Company**

Factories: Akron, Ohio  Branches in All Principal Cities

*There is nothing in Goodrich Advertising that isn't in Goodrich Goods*

# Inter-State

We have a money making proposition for every live dealer in the country. It will pay YOU to investigate it NOW.

**Inter-State Motor Company**  
Dept. C Muncie, Indiana

## The Searchlight Gas Co.

1016 Karpen Building

CHICAGO, ILLINOIS

Stronger than ever, legally, financially and in the esteem of the trade. Watch us grow.

### BRANCHES AND REFILLING STATIONS:

Warren, Ohio  
Chicago, Ill.  
Detroit, Mich.  
Camden, N. J.  
Philadelphia, Pa.  
Kansas City, Mo.

San Francisco, Calif.  
Buffalo, N. Y.  
Atlanta, Ga.  
Dallas, Tex.  
San Antonio, Tex.  
Boston, Mass.

Los Angeles, Calif.  
New York City  
Syracuse, N. Y.  
Minneapolis, Minn.  
Toronto, Canada  
Indianapolis, Ind.

## Spicer Universal Joints



Universally Accepted as the Most Dependable Flexible Connection Known to Motor Car Practice

Oil-Tight PARTS INTERCHANGEABLE Dust-Proof

**SPICER MANUFACTURING CO., Plainfield, N. J.**

Sales Representatives:  
K. Franklin Peterson, 122 S. Michigan Blvd., Chicago.  
L. D. Bolton, 2215 Dime Savings Bank Bldg., Detroit.  
Thomas J. Wetzel, 29 W. 42d St., New York  
Foreign: Benjamin Whittaker, 21 State Street, New York

## WINTON SIX

Judge by the Best

Never judge six-cylinder merit by cheaply-built sixes, by new and unproved models, or by assembled sixes. Cars built to meet a demand seldom have merit equal to cars which create that demand. Remember that the demand for six-cylinder cars was created by the Winton Six.

**THE WINTON MOTOR CAR CO.**  
424 Berea Road, Cleveland, Ohio

*World's First Maker of Sixes Exclusively*

## HOUK Detachable WIRE WHEELS

*The wheel that makes any car modern*

**Houk Mfg. Company** 1700 Elmwood Avenue,  
Buffalo, N. Y.  
For George W. Houk Co. (Licensed Under Rudge-Whitworth)

Ask the agents for Haynes Cars  
what they think of the

## LEECE-NEVILLE

STARTING and LIGHTING SYSTEM

They know what service the system  
gives on Haynes Cars—just ask them.

**The Leece-Neville Company**  
1059 Power Avenue CLEVELAND, O.

(31)



## Valuable Tire Book FREE!

Send at once for our book "Care and Repair of Tires" and secure the most valuable information on the care, up-keep, and repair of Auto tires. In this book you will learn—

Correct Pressure  
Correct Size  
Care of Rims  
Care of Spare Tires  
Care in Winter

Emergency Repairs  
Prevention of Overheating  
Effects of Careless Driving  
How to cut Repair Bills  
How to Get 10,000 Miles Use

and you will also find out how to keep down tire repair bills with

## SHALER Vulcanizers

This wonderful tire accessory repairs cuts, punctures, slits, or blow-outs in casing or inner tube anywhere and leaves the vulcanized spot the strongest part of the tire. Send for this free book.

**C. A. Shaler Co., 225 4th St., Waupun, Wis.**

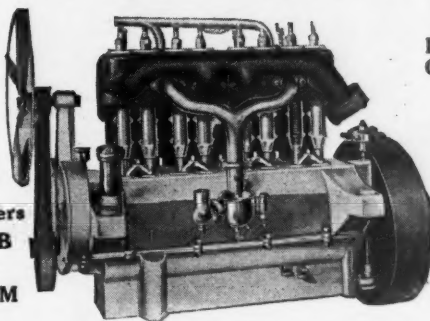
## Brennan Standard High Grade Motors

Large Bearings  
Long Stroke  
4 and 6 Cylinder

Our leaders

**MODEL B**  
4½x5

**MODEL M**  
4x5



High Grade 4  
Cycle Motors

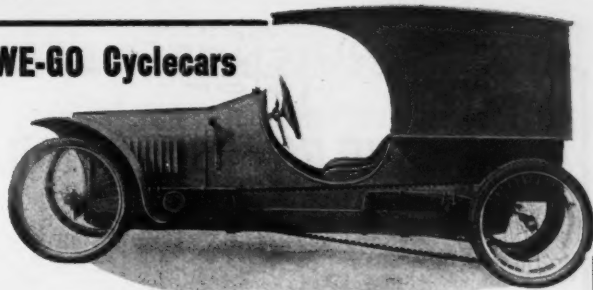
FOR

Elmore Cars,  
Warren, Corbin, White  
Steam Cars  
and standard makes of cars  
and trucks, also transmission gears.

4 Cyl., 5x5, 40 H. P., 4 Cyl., 4½x5, 35 H. P.

**BRENNAN MOTOR MFG. CO., Syracuse, N.Y.**

## O-WE-GO Cyclecars



### IMMEDIATE DELIVERIES

Full panel delivery with top; equipped with electric lights, glass wind shield, electric horn, pump, set of tools, and repair outfit. **PRICE \$405.**

Two pass. roadster with same equipment except top, \$385

WRITE FOR CATALOGUE AND SELLING PLAN

**OWEGO CAR COMPANY, 446 Main St., Owego, N. Y.**

## KINGSTON CARBURETOR

### Save Money by Economizing Gasoline

Four floating bronze ball valves opening automatically under different motor suction supply a uniform mixture at any speed, regardless of hot, cold, wet or dry weather.

Write for details and let us tell you why so many manufacturers are adopting this carburetor as standard equipment

Made by the oldest manufacturers of carburetors in America

ESTABLISHED 1895

**BYRNE, KINGSTON & COMPANY, Kokomo, Ind.**

You can take a thousand miles of service out of a set of tires by driving them insufficiently inflated over ten miles of road.

Use the New Positive Lock Stop

## TWITCHELL AIR GAUGE

and save your tires



"TIRE INSURANCE FOR \$1.00"

Simple, Accurate, Durable and Easily Read

For sale by Jobbers, Dealers, Garages, or

**The Twitchell Gauge Co.**

1201 Michigan Avenue

Chicago, Illinois

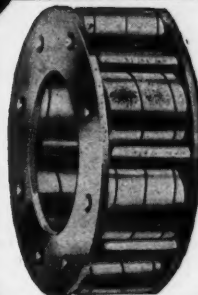
## FEDERAL Double-Cable-Base TIRES

NO MORE SIDE-WALL BREAKS — RIM-CUTS — PINCHED TUBE — BLOW-OFFS

**Federal Rubber Manufacturing Co., Milwaukee**

Branches, Service Stations and Distributors at all Principal Points

## Hyatt Quiet Bearings



Lead the world in quantity of production. Twelve mammoth factory buildings required to supply the demand.

### SERVICE STATIONS

756 Woodward Ave. .... Detroit, Mich.  
1120 Michigan Ave. .... Chicago, Ill.  
4th & Middlesex Aves. .... Harrison, N. J.  
169 Massachusetts Ave. .... Boston, Mass.  
500 Hennepin Ave. .... Minneapolis, Minn.  
1210 Figueroa St. .... Los Angeles, Cal.

**HYATT ROLLER BEARING CO.**  
DETROIT, CHICAGO  
NEWARK, N.J.



## THE RUTENBER MOTOR

MANUFACTURED SINCE 1901 FOR HIGH GRADE  
**AUTOMOBILES AND TRUCKS**

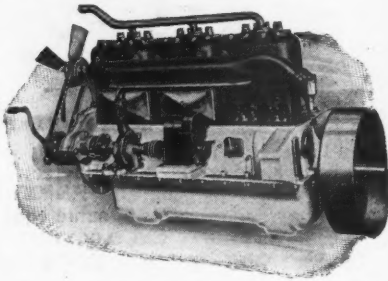
8" x 5 1/2" four and six cyl.  
4" x 5 1/2" four cylinder  
Standard or Unit  
and

4 x 4 and 4 1/2 x 5 1/2 stand-  
ard types, all L head, 4  
cycle.

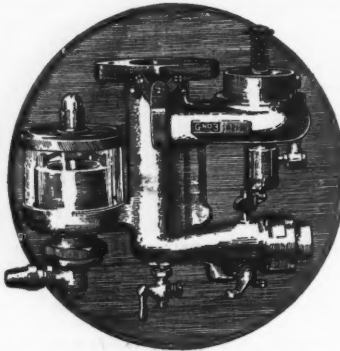
Manufacturers are invited  
to investigate our service  
and our facilities.

Literature on request.

**The Rutenber  
Motor Company**  
Marion, Indiana



More 1914  
pleasure car  
and commer-  
cial car  
models are  
equipped  
with STROM-  
BERG Car-  
buretors  
than with  
any other  
make of car-  
buretor.



A STROM-  
BERG under  
the hood is  
the hall mark  
of a QUAL-  
ITY car.

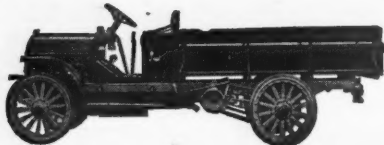
Write for  
free booklet  
containing  
"Reasons  
Why."

*"The Accepted Standard"*

**Stromberg Motor Devices Company, 54 East 25th St Chicago, Ill.**

## Republic Trucks

**2000  
Pounds  
Capacity**



**\$1350**  
(Chassis  
only)

2000 lb. REPUBLIC TRUCK WITH EXPRESS BODY

**Alma Motor Truck Company**

Sales Office: 890 Woodward Ave., Detroit, Mich.  
Factories, ALMA, MICH. Service Stations, EVERYWHERE

## PREMIER AMERICA'S GREATEST TOURING CAR



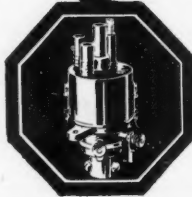
**PREMIER MOTOR MFG. CO.**  
INDIANAPOLIS, INDIANA

## CONNECTICUT AUTOMATIC IGNITION

See Our Announcement  
**July 2nd Issue**

This Publication

**Connecticut TELEPHONE & ELECTRIC Company**  
MERIDEN, CONN.



## MARMON

"The Easiest Riding Car In The World"

**Marmon "48"**  
Six Cylinders  
\$5000

**Marmon "41"**  
Six Cylinders  
\$3250

**Marmon "32"**  
Four Cylinders  
\$3000

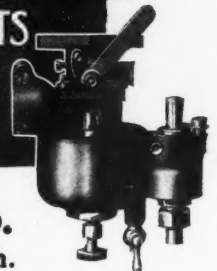
**Nordyke & Marmon Co.,**  
Indianapolis (Est 1851) Indiana

Over Sixty Years of Successful Manufacturing

## HOLLEY CARBURETOR

NO MOVING PARTS  
ONLY ONE ADJUSTMENT

WRITE FOR  
PARTICULARS



**Holley Brothers Co.**  
Detroit Mich.

See our  
announcement  
this publication  
July 2nd  
Issue

**Laidlaw  
BURBANK**  
MOTOR CLOTH

**The Laidlaw Company, Inc.**  
126-132 West 46th Street New York

# The Clearing House

of the Motor Car Industry

*For Second Hand Cars Surplus Parts, Accessories, Tires, Machinery & all other Special Announcements of a Similar Character.*

**ADVERTISING RATES** ½ inch—One time \$2.40. 1 inch—One time \$4.50. 1½ inches—One time \$6.25. 2 inches—One time \$8.75.  
Rates for other spaces and longer terms furnished upon request.

## CARS FOR SALE

**Brand New Studebaker Delivery Cars**  
While they last.....\$980  
Regular price \$1180

ADDRESS BOX E 136, CARE MOTOR AGE

## CYCLECARS FOR SALE

Two 1914 DUDLY cyclecars; one brand new, with top; the other without top, and run 400 miles. Both in perfect condition. Closing out to quick buyers. **ORAN C. SNYDER, 55 E. Broad St., Bethlehem, Pa.**

## FOR SALE

Six Sixty Alco, complete with starting and lighting system, tire inflator, new 1913 body, etc., good condition.

**REINHARD BROS. COMPANY, Minneapolis**

**FOR SALE AT A GREAT BARGAIN**  
New 1914 Lewis Six and Herff-Brooks Six, both in perfect condition, at less than the cost to build, if taken at once.

Address **B. F. GOLLMAR, Baraboo, Wis.**

## FOR SALE CHEAP

Model D Monitor 1-ton truck with wind shield, top and roll curtains; in excellent running condition.

**LESLIE JAMES, Richland Center, Wis.**

## FOR SALE OR TRADE

20 horse power sliding gear Maxwell Runabout. Address Box 223, Toulon, Ill.

## Get Our Latest Bulletin OF USED CARS

You will surely find one to fit your requirements. You can get from us good, serviceable machines for \$400 and up. Let our reputation be your guide.

## PACKARD MOTOR CAR COMPANY OF CHICAGO

2367 Michigan Avenue

## Mitchells, Rebuilt, Guaranteed

These cars are fully equipped. Call or write for further particulars.

## MITCHELL AUTOMOBILE CO.

2334-36-38 Michigan Ave., Chicago

## STANLEY STEAMER

10 H. P., fully equipped, A1 condition. New boiler. For quick sale, \$285.

Address **BOX E 123, care Motor Age**

**STEARNS, 30-60, OVERHAULED**  
and repainted, demountable rims, up-to-date in every respect.

## CONDON

2635 Wabash Ave., Chicago

## 1912 PULLMAN, SIX CYLINDER

Seven passenger, good condition, needs painting, cheap for cash if taken at once. No trades.

## MONROE MOTOR CAR CO.

1034 Main St. Buffalo, N. Y.

## CYCLE CAR ACCESSORIES

**STEERING KNUCKLES, YOKES,**  
front axles, springs, wheels, gear or friction transmission.

**MINNEAPOLIS MOTOR CO., AGENCY**  
1123 Michigan Ave., Chicago

## Do You Want a Cyclecar?

Complete set of parts machined and painted ready to assemble, \$275.00.

Complete set of blue prints, \$5.00.

Should you buy the outfit we will credit you \$5.00.

Outfits ready for immediate shipment can be assembled in one day.

## YANKEE CYCLECAR COMPANY,

517 Jackson Blvd.

Chicago

## COMMERCIAL COLLECTIONS

NEW YORK DETROIT BOSTON

## ADOLPH M. SCHWARZ

ATTORNEY AT LAW

## Commercial Collections Everywhere

First National Bank Building

CHICAGO, ILL.

TELEPHONES CENTRAL 6435, 6436, 6437

**Jesse A. Joseph, Att'y at Law, Manager**

References: The leading manufacturers of motor car accessories, parts and supplies

—Ask for our "AUTO FOLDER"

## MAGNETOS

**ALL MAKES OF MAGNETOS AND COILS**  
repaired, bought, sold and exchanged. Service station for Simms, Michigan and National. Mail orders given special attention. Get our prices before going elsewhere. **HECHT MAGNETO EXCHANGE, 228 West 49th Street, New York.**

**Every Make of Magneto & Coil Repaired**  
We carry a complete stock of parts. Write for prices and exchange plan. Large stock of used magnetos at special prices. **Pellet's Magneto Exchange, 1606 Michigan Ave., Chicago, Ill.**

## MAGNETOS

Repaired, remagnetized; prompt service on all makes.

Get our exchange proposition on new K-W for old equipment.

Spark Coil, Storage Battery and Carburetor Repairs.

Northwestern Distributors.

K-W magnetos. Schebler carburetors. Vesta lighting equipments.

Kellogg Self Starter and Tire Inflators.

## REINHARD BROTHERS CO.,

Minneapolis, Minn.

## MAILING LISTS

**COLORADO MOTOR REGISTRATIONS.**  
First lists available under new law. Automobile registrations furnished weekly during entire year 1914 for \$50. Also have dealers and motorcycles. **E. K. MERRITT, 1560 Race St., Denver, Colo.**

**GET LIST OF AUTOMOBILE REGISTRATIONS**  
direct from State House. Quickest and best daily service. \$45 for entire year, or at rate of \$4 per month. Special lists of all kinds promptly compiled. **DONNELLY, Box 180, Albany, N. Y.**

**MAILING LISTS AND STATISTICS.** Owners or dealers; any state, county, city; weekly and monthly supplements at lowest prices. Special lists of electric, trucks, Fords, Studebaker, Overland, etc. **MOTOR LIST CO. OF AMERICA, 220 News Arcade, Des Moines, Iowa.**

## New Jersey Auto Registrations

Send for sample page and get list from reliable party right in Trenton. Daily service only \$70 for entire year 1914. **H. J. Tindall, 47 W. State St., Trenton, N. J.**

## NORTH CAROLINA AUTOMOBILE OWNERS

Up-to-date lists 12,000 names, \$15.  
Address **W., Box 426 Raleigh, N. C.**

## MOTORIST'S BOOKS

## Ford Model T Reference Book

Second edition. A manual on care, repair and operation. Makes you master and mechanic of Ford Model T. Details dismantling and assembling of its mechanical parts. Troubles located and readily remedied by digest index. Circular on request, or sent post-paid, \$1.00.

**FORD REFERENCE BOOK CO.,**  
57 W. 125th St., New York, N. Y.

**PARTS AND ACCESSORY MAKERS**  
The motorcycle field is well worth your attention. 105,000 new machines in 1913. Leading Medium. (Paid circulation over 11,600) **"MOTORCYCLE ILLUSTRATED"**  
51 Chambers Street, New York.

## THE PRACTICAL HAND BOOK

of Gas, Oil and Steam Engines.

Send for complete circular.

**CHARLES C. THOMPSON CO.**

1130 S. Wabash Ave., Chicago, Ill.

## PARTS AND ACCESSORIES FOR SALE

## A A A Tops, Cushions or Trimmings

New or recovered. Curtains, new lights in curtains, carpet rugs, etc.

**NEWTON & SON, 120 Elm St., Cortland, N. Y.**

## ACCESSORY CATALOG

Mailed on request. Dealers, send list of wants for special prices. Westchester cup grease bbl. lots 4c pound. **WESTCHESTER ACCESSORIES CO., 1777 Broadway, New York City.**

## A GOOD WHITE STEAMER ENGINE

Generator and Burner and several other good parts cheap.

Address **BOX E 20, Care Motor Age**

## American Underslung and Marion

Motor car parts and service.

**CHARLES E. RIESS & CO., Inc.**

1690 Broadway, New York.

## ATTENTION AUTO OWNERS!

Auto Tops Built and Repaired, seat and Top Covers made by sending old ones for pattern. We make for 1913-1914 Ford Touring Cars, Slip Covers, covering all leather on car, together with top cover to match. Price, \$14.75. Roadster, \$9.25. Studebaker, Herr Brooks, Overland, Buick and Maxwell owners, write for samples and prices. Discount to dealers. Money back if not satisfactory. **INDIANA AUTO TRIMMING CO., 216 No. Mich. St., South Bend, Ind.**



# The Clearing House—continued

## Annular Ball Bearings Reground

We carry a complete stock of re-ground bearings of all makes and sizes, for immediate exchange.

**GET OUR PRICES**

### Ahlberg Bearing Co.

2640 Michigan Avenue  
CHICAGO, ILLINOIS

1796 Broadway New York City  
806 Woodward Ave. Detroit, Mich.  
98 Massachusetts Ave., Boston, Mass.

**ATTENTION, HENRY OWNERS**  
We are prepared to fill orders promptly for repairs for Henry Cars.  
**MUSKEGON AUTOMOBILE CO.**  
Muskegon, Mich.

**AUTO OWNERS**  
Wholesale Prices. Free Catalogue.  
State what car you own.  
**CONSUMERS AUTO SUPPLY CO.**  
123 W. Madison St. Chicago

## AUTOMOBILE PARTS

### MICHIGAN, MORA AND DRAGON PARTS IN STOCK

We maintain a complete stock of parts for the above cars.

Price list on application.

67 Laurel Street, Philadelphia, Pa.

**AUTO SALVAGE CO., 1436 Wabash Ave., Chicago**  
50 H. P. double chain drive trans., \$75; Splittdorf lighting generator, \$35; single cyl. Cadillac engine, \$25; 4 cyl. 50 H. P. motor, \$75; Model B Prest-O-Lite, \$10; 2 cyl. Buick parts.

**AUTO TOPS BUILT and REPAIRED**  
Seat covers and body building, remodeling and trimming. Write for prices.  
**BITELY TOP & BODY CO.,**  
404-410 Laflin St., Chicago, Ill.

## AXLES

Rear Axles with 3 speed transmission, complete with hubs, hub caps, bearings, 36x4½ wheels with demountable rims, torsion tube, drive shaft, universal joint, complete, \$150.00.  
Lewis Axles, front and rear, with torque rod, \$85.00.

**Automobile Appliance Co.**  
1436-38 Michigan Ave. Chicago, Ill.

## BODIES, WINDSHIELDS, WHEELS, TIRES

1914 New Ford T Roadster Bodies with tops, \$50 each. Taken off new cars we changed to delivery cars. Open express bodies \$15 up. New windshields, clear vision, \$10. 32-inch solid rubber tires on wheels, only \$12. Slightly used 34x4 detachable tires \$14; tubes \$3; like new and firsts.  
**Benedict, 64 Winder St., Detroit, Mich.**

## BUILD A ROADSTER

Frames, \$6.00; Axles, \$45 set; Wheels, 32x3, \$9.00 set; Springs, \$9.00 set; Round Gasoline Tanks, \$3.00; Open Roadster Bodies, not upholstered, \$10; Fore-door Roadster Bodies, upholstered, \$35. These parts are all new and fit each other. Thousands of other auto parts at bargain prices—Let us know your needs.

**DEQUINDRE AUTO REPAIR CO.,**  
474 Larned St. E. Detroit.

**Commercial Bodies for Ford Cars**  
Hand made seat covers for all cars  
We clean seat covers  
**AUTO CAPE TOP CO.,**  
2334 Michigan Ave., Chicago, Ill.

## BUILD YOUR CAR

Complete Chassis in parts, \$400.00

Get our circular

**AUTO PARTS COMPANY,**  
737-739 Jackson Blvd.,  
Chicago

## DISC CLUTCH OIL

Long and exhaustive tests conducted by many leading disc clutch makers have definitely proved that disc clutch oil is superior to any mixture tried.

Nine-tenths of clutch trouble is due to the improper mixture, either too light or too heavy. Send one dollar for a trial can and prove it for yourself. Agents wanted. Address Dept. 10.

**TRENT MACHINE CO.,**  
228 Tyler St., Trenton, New Jersey  
**EVERITT "30" RADIATORS**  
Honeycomb ..... \$28.00  
Tubular ..... 22.00  
**AUTOMOBILE APPLIANCE CO.**  
1436-38 Michigan Ave. Chicago, Ill.

**Fix Up Your Automobile With Boyer's**  
Air Drying, Glossy Refinisher and Color Finishes—all colors. Write us condition of your car.  
**BOYER'S LABORATORY COMPANY**  
7 West Michigan St., Chicago

## Ford Automobile Specialties

Look for the APCO on the box. If you see this trade mark you are safe in every way, for it means "Every sale a sale of satisfaction." Your money will be cheerfully refunded if you are at all dissatisfied. The APCO goods cost you no more, so insist and don't let your dealer sell you "something just as good" and on which all sales are final. He makes more money, but where do you get off? Remember, if your dealer won't refund your money we will. You buy APCO and let the other fellow get the imitation. Sold the World Over.

**AUTO PARTS CO., Providence, R. I.**  
The Originators and Largest Manufacturers of Ford Specialties in the World.

## FORD DEALERS

Get our catalogue on commercial bodies for the Ford car.

**F. E. LORTZ Co., Chicago, U. S. A.**

## FORD DELIVERY BODIES

12 styles, all sizes. Agents wanted everywhere.  
**COLUMBIA BUGGY CO.,**  
21-23 Selden Ave. Detroit, Mich.

## Ford Dealers and Owners Attention

I have what you long have been looking for, "THE TANDEM FRONT RADIUS ROD BRACE AND AXLE ALIGNER." No more bent or broken Radius rods; will line up your axle and keep it there, makes your Ford steer easy through sand or mud. Order one now; your money back if not satisfied. Price, \$3.50. Special proposition to dealers.

**A. S. HALLS, ORTONVILLE, MINN.**

## FORD DELIVERY BODIES

Adapted to every line of business.  
Write for our catalog showing our complete line.

## Auto Remodeling Co.

1501-5 Michigan Ave.  
Chicago, Ill.

## Ford Honeycomb Radiators

This radiator will probably cool any Ford motor and make your Ford a better car. Get our dealers' proposition. Price, \$25.00 f. o. b. Detroit.

## DETROIT RADIATOR & SPECIALTY CO.,

965 Woodward Ave., Detroit

**FORD OWNERS AND DEALERS!**  
You will save trouble and money by installing our timer elevating device.

**FORD PARTS SPECIALTY CO.,**  
1211 Main St., Richmond, Ind.

## FORD OWNERS

Ask your nearest agent for the Stam-Ford Brand of Ford Specialties. None better made.  
**JOHN B. STAM & CO., MFRS.**  
1789 Broadway New York City

## FORD OWNERS

Equip your cars with Seat Covers. Our direct to car-owners plan will save you money. Ten thousand satisfied customers last year.

**GLOBE SEAT COVER CO.,**  
Dept. M, RACINE, WIS.

## FORD OWNERS

Is the bottom of your crank-case oily? Write for our folder describing our spring radius rods which absorb the front axle pound and keeps from loosening the rivets in your crank-case. Saves its cost many times over by saving crank-case leaks.

Folder M on Request

**ANGIER'S, STREATOR, ILL., U. S. A.**

**Ford Owners—Purdy Exhaust Horn**  
for Fords is being used everywhere—positively will not clog or choke. Write today for catalogue. DEALERS, ask for prices.  
**Purdy Bros. Co., 49 E. 55th St., Chicago**

## FORD OWNERS

We can make your car the easiest rider made with light or heavy load; no jolt, no jars, no upthrow. Write us.

**Automobile Machine Co., Canisteo, N. Y.**

## Ford Owners and Dealers!

The TOWNSAN VALVE ADJUSTER AND SILENCER will silence your valves. You can adjust them quickly. Most all jobbers or address

**Townsan Auto Specialty Co.,**  
Mitchell, South Dakota

## FORD RACING FORD

Write us for racing bodies.  
**AUTO REMODELING CO.,**  
1501-5 Michigan Ave., Chicago, Ill.

## FORD RADIATORS

Model T Honeycomb ..... \$22.50  
**AUTOMOBILE APPLIANCE CO.**  
1436-38 Michigan Ave. Chicago, Ill.

## FORE DOOR BODIES

1914 Models, five-passenger, fully upholstered; fit most any car. Cost, \$350.00; our price, while they last, \$85.00. Write for full description.

## THE M. & M. COMPANY

480-500 Prospect Ave., Cleveland, Ohio

## Fore Doors for All Old Models PRICES RIGHT

**F. E. LORTZ CO.,**  
1832 MICHIGAN AVE. CHICAGO

## FOR SALE

A small number of modern, well designed and constructed six, five and four-passenger touring bodies and comfortable roadsters painted and trimmed. Will change and guarantee to fit your car. Write us.

## IRVIN ROBBINS & CO.

Industrial Bldg., Tenth and Canal,  
Indianapolis, Ind.

## FOR SALE AT A BARGAIN

New 5x8 four-cylinder, governor controlled engine, fully equipped with carburetor, magneto. Will sell for much less than cost. **FRED HANSON, 570 Prior Ave., St. Paul, Minn.**

## FOR SALE

1 Miller Steam Vulcanizer, complete for casings and tubes, \$25. 1 25 H.P. new motor, never been used, with complete chassis, with a 4 speed forward transmission; first \$100 takes it.  
**VIRGINIA GARAGE, VIRGINIA, ILL.**

## FOR SALE

38 American Ball Bearing Axles, front and rear, large size, and frame 13' 6" built for same. Will sell lot or singly. No reasonable offer refused.  
**CRESCENT MOTOR CAR COMPANY**  
1st and George Sts. St. Louis, Mo.



# The Clearing House—continued

## FOR SALE

25 Lincoln Milling Machines, \$25 to \$100 each.  
**LUCAS & SON, Bridgeport, Conn.**

## Full Panel

**Commercial Delivery Bodies**  
 For Ford cars exclusively. Price \$68.00.  
**FORD COMMERCIAL BODY CO.,**  
 1790 Broadway, New York  
 Send for Catalog B

## GET WHAT YOU PAY FOR

Our Hydrometer tells you exactly what grade gasoline you are getting. Sent prepaid, complete with glass jar and case for One Dollar. 25,000 sold this year. Send for yours today.

**MARSHALL, WALTER & CO.,**  
 Milwaukee, Wisconsin

## GRIND YOUR OWN CYLINDERS

In your own shop. Save money. Make money. Perfect work. Lowest cost. No rotating of cylinders required on the Acme Grinder. Particulars on request. **ACME GRINDER CO.,**  
 2740 Humboldt Ave., So. Minneapolis, Minn.

## Guaranteed Storage Batteries

\$7.50 up. All makes repaired or taken in exchange. Send for prices.  
**SOLAR BATTERY MFRS.,**  
 827 E. 43rd St. Chicago, Ill.

# Herreshoff Motor Car Owners

This company has been reorganized under new management and with new capital. We are moving our plant to Indianapolis, Indiana. Our policy will be to furnish prompt, first class service for all repair parts to Herreshoff cars. For immediate attention to orders for repair parts write direct to our new factory, South Meridian Street and Belt R Ry., Indianapolis, Indiana.

**Herreshoff Motor Co.**  
 S. Meridian St. & Belt R Ry.  
 INDIANAPOLIS, IND.

## Guaranteed Radiators

Not always necessary to buy new radiators. New cores can be furnished for frozen or damaged radiators. We build the fin and tube type. Guaranteed copper fins and tube.

We also repair and furnish new cores for Mays radiators.

We build new cores for all makes and for all cars. Get our prices. You will save money.

Cores in stock for many standard radiators such as Hupps, Warrens, Herreshoffs, Buicks, E. M. F. 30, Studebaker, Hudson 20, Cadillacs and several others.

We can build and fit a new core in your radiator in two days—if in stock, in one day.

Write for bargain sheet of accessories.

## HURON RADIATOR & LAMP CO.,

253-255 Jefferson Ave., Detroit, Mich.

Terms: Cash with the order.

## JOBBER'S AND GARAGES

Get our proposition on fibre gears for all makes of speedometers. We make anything you want from fibre.

**OGDEN FIBRE GEAR & TIRE CO.,**  
 Columbus, Ind.

## Looking for Bargains

### Read This Adv.

### Prices 30-50%

### Below Usual Cost

### Accessories

Fore door touring bodies, regular price \$250. Our price \$85. New Runabout bodies \$40 and \$60. Pierce-Arrow and Cadillac Radiators \$30. Ford Radiators \$17 and a thousand other radiators at unheard of prices. Rayfield Carburetors \$6.50. Holly Carburetors \$2.50. Flanders Carburetors \$1.00. Schebler Carburetors \$7.90 (Model L sizes). Transmissions: Brown-Lipe \$50.00. Complete steering gears, standard makes, \$15. Type "S" Remy Magnets (without coils) \$9. "Mea" high tension 4-cyl. magnets \$25 each. "Disco" 4 and 6-cyl. self-starters \$5.00. Complete electric lighting system, regular price \$100. Our price \$40.00. Auxiliary spring shock absorbers \$10 (regular price \$35). Prest-O-Lite tanks, Model E, \$9.75. Prest-O-Lite tanks, Model B, \$13.50. Mondex Helix shock absorbers, per set of 4, regular price \$50. Our price \$15. Windshields \$5, \$7.50, \$10 and \$15. (Sold elsewhere at twice this amount.)

## Tires

30x4.....\$14.65      30x3 1/2.....\$9.55  
 30x3.....6.65      28x3.....6.25  
 All other sizes in proportion.

## Motors

Lyon Atlas Motors, fit most any chassis, 4-cyl., 4-cycle, regular price, \$510. Our price \$165. 4 and 6-cyl. Herschell-Spillman motors, \$275. 4-cyl., 4-cycle "Poss Motor," regular price, \$400. Our price \$110.

**IF IN NEED OF AUTOMOBILES OR MOTOR TRUCKS** send for special lists. If it is in the accessory line we have it. Write us for special quotations. Our "PRICE WRECKER" No. 4 is just off the press. Write us for a copy. We will gladly send it to you FREE for the asking.

**Times Square  
 Automobile Co.**  
**World's Largest Dealers**  
 Broadway and 56th St., New York  
 1210 Michigan Ave., Chicago, Ill.

## Liquidator's Sale

### Complete Marquette Auto Plant

### Extraordinary Price Inducements

I have been authorized to dispose of the entire lot of automobile parts, supplies, accessories, tools, bodies and everything for the automobile, including parts to build a complete car. This is the biggest lot of parts ever offered at direct sale.

Spark Plugs .....	\$ .19
End Wrenches .....	.15
Magneto Boots .....	.50
Dash Air Pumps .....	.79
Starting Crank Boots .....	.30
Gasoline Strainers .....	.50
Tail Lamps, Oil .....	1.50
Tail Lamps, Electric .....	1.75
Side Lamps, Oil .....	1.50
Side Lamps, Combination .....	1.75
Gas Head Lamps, per pair .....	6.25
Electric Head Lamps, pair .....	7.50
Pressed Steel Frames .....	5.00
Steering Gears, "Gemmer" .....	12.19
Steering Gears, "Jacox" .....	8.19
Weston Mott Rear Axles .....	40.00
Sliding Gear Transmissions .....	45.00
4 speed sliding gear transmissions with multiple disc clutch .....	50.00
Fore door roadster bodies—in rough .....	20.00
Fore door roadster bodies—painted and upholstered .....	55.00
Touring car bodies—painted and upholstered .....	65.00
Model H High Tension K. W. Magnets .....	18.50
Harford Shock Absorbers—set .....	20.00
E. Z. Rider Shock Absorbers for Ford Roadster and Touring Cars—set .....	15.00
40 H. P. Motors .....	125.00
Exide Batteries .....	5.50
Wheels, all sizes .....	3.00
Front Axles .....	10.00
Electric Horns .....	2.49
Carburetors—Rayfield-Schebler, Kingston and Fletcher .....	5.19
Windshields .....	9.00
Stromberg Carburetors .....	8.19
1" Buffalo Carburetors .....	3.00
Oval Gasoline Tanks—11x22x29 .....	3.00
Straight High Tension Volta Magnets .....	15.00
4 Cyl. Remy Magnets with coil .....	20.00
Ford Lighting Outfit .....	2.25
Ford Lighting Generators .....	25.00
Ford Wheel Pullers .....	.30
Rayfield Carburetors with Manifold for Ford Model "T" .....	8.20
Ford Oil Gauges .....	.30
Ford Spark Plugs .....	.19
4 Cyl. Remy Coils .....	6.00
Splitdorf Coils .....	6.00
Standard Speedometers for 36x4 wheels .....	7.00
Stewart Speedometer Heads .....	3.95
Tool Boxes—18x8x9 .....	1.25
Tool Boxes—24x9x8 1/2 .....	1.50
Electric Side Lamps—for cycle cars .....	1.00
Brake Lining, per foot .....	.25
Tire Repair Kits .....	.35
Front and Rear License Brackets .....	.35
Steering Wheels .....	1.00
Tire Covers—any size .....	.75
1/2 and 3/4 Brake Rods with clevis .....	.35
Mufflers, 1 1/2 opening .....	1.50
Foster Shock Absorbers, set .....	6.00
Rear Axles with unit transmissions .....	80.00
Assorted spring clips, per doz. .....	1.00
100 Assorted Cap Screws .....	.50
100 Assorted Nuts .....	.50
100 Assorted Rivets .....	.20
100 Assorted Washers .....	.25
Erle Pipe Wrenches .....	.75
Watch dog locking devices .....	.75
Warner Autometers—complete .....	9.50
Rumble Seats .....	3.50
Tool Boxes .....	1.25
Robe and Foot Rests .....	.35
Auto Jacks .....	1.00
Tire Pumps .....	1.50
Metal Polish—1/2 and 1 gal. cans, per gallon .....	.50
Auto Soap, 5 and 10 lb. cans, per pound .....	.10
Tool Kits .....	1.09
Tire Chains, many sizes, for .....	3.09
Bulb Horns—complete .....	.75
Vulcanizers .....	.79
Stewart Gas Savers .....	3.50
Radiators for many cars .....	20.00
Springs—many sizes .....	3.00

Almost Everything at a Special Low Price—  
 Send for Big Catalogs

**Alfred O. Dunk**  
 Liquidator

412 Lafayette Boulevard  
 Detroit, Michigan

This is my fifty-third sale. I have closed out that many factories.

# The Clearing House—continued

**Maxwell Owners and Repairmen**  
Why pay 20 per cent advance for your parts?  
We can supply 75 per cent of your wants at the  
old Maxwell-Briscoe list. Stoddard-Dayton  
transmission and equalizing gear parts at old  
list. Why pay more?

SEND FOR PRICE LIST

**M. P. SUPPLY COMPANY**  
Atlanta, Ga.

## Original Repair Parts Factory

We furnish repair parts for over 53 models of  
cars. Own original patterns, tools, etc., includ-  
ing Warren, Elmore, Marquette, Rainier, Welch-  
Pontiac, Welch-Detroit, F. A. L., Reliable-Day-  
ton, Barnes, De Luxe, Demot, also Michigan,  
Cutting and many others. Everything for every  
auto.

**Puritan Machine Company**  
Detroit, Mich.

## Paint Your Car Yourself

Save \$25 to \$75 by doing the work at  
home with the Arsenal system. Our big  
free booklet, "The Car Beautiful," tells  
how. Send for it today.

**Arsenal Varnish Company**  
Auto Dept. Rock Island, Ill.

## PARTS! PARTS! PARTS!

We have a large stock of parts for  
Chalmers, Carter Cars and Ramblers  
which we will sell for half price.

**PACIFIC CAR COMPANY**  
Tacoma, Wash.

## Radiators

Our Genuine Cellular (commonly called  
Honeycomb) radiators will properly cool your  
motor. Each radiator carries with it "a money-  
back-if-you-want-it-guarantee."

Ford "T".....	\$25.00
Buick 10-24-25-34-35-36.....	27.50
Buick 16-17-19-26-27-28.....	35.00
Buick 21-38-39-43.....	37.50
Cutting 35.....	22.00
Hupp 20.....	25.00

5% Discount allowed for cash with order.  
All orders shipped same day as received.

**DETROIT RADIATOR & SPECIALTY CO.**  
963 Woodward Ave. Detroit

## REPAIR PARTS

American Underslung Radiators..	\$ 35.00
Six cylinder crank shafts.....	30.00
Four cylinder motors, new.....	150.00
Six cylinder motors, new.....	300.00
Fly-wheels finished.....	3.00
Connecting rods, rough.....	.75
Pistons, machined.....	2.00
If you have an American car, let us quote you on the repair parts.	
Electric starters, complete with battery.....	50.00
Shop worn tops to fit most any car.....	25.00
Ford radiators.....	18.00
Weston-Mott shaft drive rear axles with 32x3½ demountable wheels, per pair.....	60.00
Get our latest Bargain Sheet.	

**AUTO PARTS CO.,**  
737-739 Jackson Blvd. Chicago

## Radiators

### WRIGHT-HAS-IN-STOCK

Complete new radiators for all standard models.  
Replacement our specialty. Delivery on receipt  
of order.

**WRIGHT COOLER & HOOD CO.**  
8th Street, Muskegon, Mich.

### RECTIFIERS

To change from A-C circuit 1 to 8 ignition,  
lighting or starting batteries at one time; \$12  
and upwards. **AMERICAN BATTERY CO.,**  
1124 Fulton St., Chicago.

### "SAFETY FIRST"

Most accidents are caused by "cloudy" glass  
fronts. Our patented glass front cleaner re-  
moves rain, snow and "breath-steam" from  
windshields instantly. Made of brass; cannot  
rattle; always ready; operates from driver's  
seat. Send two dollar bill for one today and  
be safe. Tomorrow you might have accident  
costing two thousand, maybe life.

**MARSHALL, WALTER & CO.**  
Milwaukee, Wisconsin

## SAFETY RADIUS RODS FOR FORDS

Safety Radius Rod and Front Axle Sup-  
port only device bracing axle direct to  
frame. Prevents broken and bent radius  
rods. Takes all strain from crank case.  
Makes car steer better. Every Ford  
owner needs one.

**BERNARD MONNICH**  
Hooper, Nebr.

## Speedometers Speedometers

Special prices to Ford owners for all  
makes of Speedometers and Parts.

### GENERAL SPEEDOMETER REPAIR COMPANY

53 West 63rd St. New York City

### SPEEDOMETER REPAIR CO.

We repair any broken Flexible Shaft Casing  
or Housing, Swivel Joints and all Speedometer  
Parts. Fibre Pinions, all sizes, 50c and 75c.  
All goods shipped same day received.  
1331 W. Jackson Blvd., Chicago

## "STOP THIEF"

Patented lock for Ford and other small cars.  
Impossible to start motor. Two keys with each  
lock. Sent prepaid, \$1.50. May save price of  
your car. **MARSHALL, WALTER & CO., Mil-  
waukee, Wisconsin.**

## That Mysterious Rag Duster

For dusting and polishing automobile bodies,  
windshields, lamps, pianos or any other polished  
surface. House Size 25c. Automobile Size 50c.  
Sent to any address upon receipt of price. If  
not satisfied, return duster and we will refund  
purchase price.

### THE GEM SUPPLY

1036 So. Main Street, Waterbury, Conn.

## TOOL KITS

Special Sale of Complete Tool Kits  
Why pay \$5.00 when you can get a  
standard kit complete for \$1.09?

**PURITAN MACHINE CO.**  
Detroit, Mich.

ALL PARTS ALL CARS

**Tops Built, Recovered and Repaired**  
Also top covers, radiator covers, luggage cases,  
celluloid, etc.

**C. G. MEYER & SON, Tiffin, Ohio**

### TRAVELING SALESMEN

Side line—Our Fibre gears for speedometers sell  
to all garages.

**D. OGDEN, Columbus, Ind.**

## We Tear 'Em Up and Sell the Pieces

We want old autos, condition no object. We will  
buy anything for the auto. We have all kinds of  
parts, many of them new, at unheard of low  
prices. Tires and tubes, many new, others used.  
Kingston carburetors, all sizes; will exchange for  
others. Gears of all kinds, new gas oval tanks,  
new timers, magnetos, coil. Stewart speedom-  
eters, shafts and chains, tire covers, dust hoods,  
electric horns, new brass bumpers, lamps, all  
kinds; Prest-O-Lite tanks, oilers, cylinders,  
pistons, transmissions, crankshafts, seats and  
bodies; new 30x3½ wheels, many other used  
sizes; rims; several chassis without engines; 2-  
cylinder; 4-cylinder, 6-cylinder engines; springs;  
in fact, everything that an auto needs. Corre-  
spondence solicited. If we do not have it, will  
advise you where you can get it. Anything  
bought can be returned at once, unused, carriage  
prepaid, and we will refund amount paid.

### AUTO WRECKING CO.

Old Church, 13th and Oak  
KANSAS CITY, MO.

## WE GOT THE F. A. L. AUTO COMPANY

Bought at Auction for Cash.

All service stock, patterns, jigs, tools, dies,  
blue prints, good will, etc. Everything from  
the smallest bolt to parts for a complete car.

Will Sell Direct to You

LOOK!

Batteries for lighting.....	\$ 5.50
Frames.....	5.00
Side lamps.....	1.75
Tail lamps.....	1.50
Electric head lamps, pair.....	6.25
Wheels—all sizes.....	3.00
Bodies.....	18.00
Front axles.....	10.00
Weston-Mott rear axles.....	40.00
Spark plugs.....	.19
Tops.....	10.00
Windshields.....	8.19
Transmissions.....	40.00
Hartford Shock Absorbers (set).....	20.00
Rayfield and Fletcher carburetors.....	5.19
Kingston carburetors.....	3.95
2-in. Raybestos brake bands.....	1.25
Mufflers.....	1.50
Model H High Tension K. W. magnetos.....	18.50
Atwater Kent Systems.....	18.50
Springs.....	3.00
Electric Horns.....	2.49
. Anything else you want at a price, Get our big catalogue.	

**Puritan Machine Company,**  
Detroit, Mich.  
All Parts—All Cars

## We Make Ford Racing Type Bodies

In several models for immediate delivery

**AUTO SHEET METAL WORKS**  
1532 Michigan Ave. Chicago, Ill.

## WELDING PLANTS

No. 1—Without tanks.....	\$38.00
No. 2—With acetylene tank.....	52.00
No. 3—With carbon burner.....	57.00
No. 4—With 200 ft. oxygen gas.....	61.00

### TERMS

No. 1—Cash with order.....	16.00
No. 2—Cash with order.....	32.00
No. 3—Cash with order.....	37.00
No. 4—Cash with order.....	41.00
Balance \$5.00 per month, contract, or for all cash deduct 5 per cent. Address Dept. R.	

**AUTO WELDING AND MFG. CO.,**  
Omaha, Nebr.



# The Clearing House—continued

## WIPING RAGS

No. 1 Selected Stock

Our Rag is now used successfully by the largest garages in the U. S. Write for prices. We will save you money.

Northwestern Sanitary Rag Co.  
1015-17 Holden Court Chicago, Ill.

**YOU CAN CHANGE YOUR CAR**  
into raceabout yourself. We furnish radiators, hoods, seats, tanks and fenders. Get our prices.

**AUTO SHEET METAL WORKS,**  
1532 S. Michigan Ave. Chicago, Ill.

**\$5.00 FOR \$3.00**

To introduce our new guaranteed Electric Horn we will send one large size Horn with push button and wire, Parcel Post, for \$3.00 cash with order.

**SANFORD, 346 Federal St., Rochester, N. Y.**

## PARTS AND ACCESSORIES WANTED

## WANTED

To Buy Prest-O-Lite Gas Tanks

for cash. Also automobile supplies of all kinds. Please state lowest price you will sell for. I pay cash on delivery.

**WALTER R. EBERT**

959 34th St., Milwaukee, Wis.

We will pay cash for your extra Prest-O-Lite tanks.

**E. B. COLLINS MOTOR CO.,**  
Danville, Ill.

## PATENTS & PATENT ATTORNEYS

**C. L. Parker, Patent Attorney**

Formerly member Examining Corps, U. S. Patent Office, 960 G St., Washington, D. C. Pamphlet of instruction sent upon request.

Get our square deal fee plan

Free book and free search

**MILO B. STEVENS & CO.**

53 W. Jackson Blvd., Chicago

Main Office: Washington Established 1864

**PATENTS SECURED EVERYWHERE**

My aim is to honestly advise and faithfully serve my clients. Incorporation papers prepared.

**F. V. WINTERS, Patent Lawyer,**

125 East 23rd St. New York City

## PORTABLE GARAGES

## PRIVATE GARAGES

Galvanized steel or wooden. The finest line offered. If interested write.

**Garage Factory, Beaver Springs, Pa.**

## RADIATOR AND LAMP REPAIRING

**A. A. A. Radiators Manufactured**

Any make repaired and returned same day. Radiator to fit any car shipped in 3 days.

**SHEPPARD CO., 1331 Jackson Blvd., Chicago**

Before ordering elsewhere, get our prices on new radiators, hoods, fenders, tanks and for installing new cores in old or damaged radiators. Radiator repairing our specialty.

**ILLINOIS AUTO SHEET METAL WORKS,**  
58 E 16th St., Chicago, Ill.

## CHICAGO MFG. CO.

1466 Michigan Avenue, Chicago

We are the only radiator manufacturers in Chicago making a square tube radiator. New guaranteed cores placed in old radiators. We also manufacture Hoods, Fenders, Tanks and Pans and do guaranteed repair work. Prompt service.

## ONLY RADIATOR FACTORY IN NORTHWEST

Pioneer manufacturer. Why send your radiator down east when you can ship it to us; save time, express, freight, money, and get best workmanship. Prices right. Make new radiators; allow for old one.

**TODD MANUFACTURING CO.**  
820-824 Mary Pl. Minneapolis, Minn.

## REBUILDING AND REPAIRING

## A NEW MOTOR

made out of your old one; we will rebore and grind your cylinders and make new pistons and new rings, the whole operation to be up-to-date factory methods; write or 'phone for price on your car.

**STARBUCK AUTOMOBILE CO.**

Baltimore Ave. and Fernwood, Reboring Dept.  
Philadelphia, Pa.

## AUTO SPRINGS REPAIR CO.

We manufacture and repair springs. Proper action compound put in springs.

1331 Jackson Boulevard, Chicago, Ill.

## ANDRE G. CATELAIN

General machine work for foreign and American cars. Welding all kinds of metal. Everready Automatic Engine Starter Sales and Service.

Carbon removed with oxygen

Manufacturer Catelain Hose Coupling

1446-8 Indiana Avenue Chicago

## CYLINDER GRINDING

OXY-ACETYLENE

WELDING GEARS

and Parts of Every Description

**ADAPT MACHINERY CO.**

1624-32 Wabash Ave. Chicago, Ill.

## CYLINDERS REBORED AND REGROUND

Fitted With My Light Cast Iron  
Pistons

40% to 100% lighter than standard, and with my new rings, makes a four run like a six, with a guaranteed gain in efficiency of from 25% to 50%

**McCADDEN MACHINE WORKS**  
ST. CLOUD, MINN.

## CYLINDERS REGROUND

We have special equipment for regrinding cylinders, fitting new pistons and rings. Prices, \$7 to \$15 per cylinder.

**Autogenous Welding**

**Magneto and Battery Work**

**Prompt Service**

**BERNHARD & TURNER AUTO CO.**  
Des Moines, Iowa

## CYLINDERS REGROUND

and fitted with new pistons and rings for \$7 to \$11 per cylinder. We do this class of work exclusively and are thus able to give you the highest class of work at these prices.

**CROWN MACHINE SHOP**

Crown Point, Ind.

## CYLINDER REBORED

Including piston and rings.....\$7 to \$11

**STERLING ENGINE CO.**

331 So. Clinton Street Chicago, Ill.

## FORD

**Cylinder Grinding**  
**New Pistons, Rings, Pins**

Our special equipment for grinding Ford Model T cylinders enables us to fit new pistons, new rings, and piston pins on short notice. A complete job better than new at prices that will interest Ford dealers as well as owners.

Write at once to

**AUTO ENGINE WORKS**  
St. Paul, Minn.

## SCHOOLS

AAAAA—COME TO DETROIT, the "Automobile Center," and learn the business in the largest and best equipped school in the country. **MICHIGAN STATE AUTO SCHOOL, 11-19 Selden St., Detroit.** "The Old Reliable School."

## FREE BOOKLET

"How to Succeed in the Automobile Business," on application. A Greer diploma guarantees efficiency. Largest motor college in the world—1,400 graduates—\$40,000 in modern equipment—eight instructors—actual work, repairing and driving—Day and evening classes—many owners and dealers employ Greer graduates only.

**GREER COLLEGE OF MOTORING**  
Chicago's "Safety First" Automobile School  
1456 Wabash Ave., Chicago

## LEARN REPAIRING

On every make, driving on dozens of cars, starting and lighting with largest equipment in America; steam vulcanizing, oxy-acetylene welding and everything known to this business. A \$20 to \$50 course brings you \$1,000 to \$2,500 a year.

**Academy of Automobile Engineering.**  
1452-54 Michigan Ave., Chicago, Ill.

## TIRES

## A1 GUARANTEED TIRES

What make do you use? What size?

WRITE FOR OUR PRICE BULLETINS

We pay express charges.

**ALLEN S. SINSHEIMER**

1503 Michigan Ave. Chicago, Ill.

**Auto Tires Recovered as Follows**

30 x 3 .....	\$5.80	32 x 3 1/2 .....	\$7.80
30 x 3 1/2 .....	7.20	34 x 4 .....	9.65
30 x 4 1/2 .....	\$12.00		

Non-Skid Treads applied from \$1.00 to \$3.00 extra. Workmanship and material guaranteed. A trial will convince. Repairing tires since 1896.

**JUNGKIND & VOGLER**

158 Chambers Street, N. Y. City  
Branch 1100 Bedford Avenue, Brooklyn, N. Y.

**AUTO TIRES 3500 MILES**

Guaranteed, 40% to 65% Off.

All standard makes. We will better any price on same quality. Get our prices before buying. Save the dealers profit. We buy and sell new and used cars. Send for accessory catalogue.

**AUTO ECONOMY CO.,**

1686 Broadway New York

## Bargains in New Tires

We can save you 40% on any size.

Send for our price list.

**SERLIN TIRE CO.**

1073 14th Place Chicago, Ill.



# The Clearing House—continued

## I'LL SAVE YOU MONEY

ON TIRES! Dollars saved on every size Signed guarantee of 3,500 miles with every tire. I'll show you how to make dollars on your old tires, too. Don't buy another tire until you get my illustrated price list. Write me today. It will pay you. State size. J. A. McMANUS, Manager.

PEERLESS TIRE COMPANY,  
304T 54th St., West, New York City

## Make Two Old Tires

Do the work of a new one. Send us two of your old casings, regardless of their condition, by our process we return you the two tires made into one ready for 2000 miles of actual service. We guarantee this mileage absolutely. We are doing it for others. Send us two old tires today, or write and ASK US HOW.

## COWANS BROS.

150 W. 55th St., New York City

## TIRES

Twenty-two years in the rubber business. It is the reputation that counts. Expert tire repairing. The best equipped shop in New York. Manufacturers for U. S. and Canada for the famous Samson Tread. Distributors for all standard makes. Get our prices before buying.

H. PHILLIPS RUBBER WORKS  
1989 Broadway, N. Y.

## TIRES—FORD—TIRES

Guaranteed Factory Firsts

30x3 .....	\$7.50
30x3½ .....	\$9.00

Get our complete tire bulletin on all standard makes.

CONSUMERS ACCESSORIES CO.,  
11 S. Meridian St., Indianapolis, Ind.

## TIRES!

FRESH STOCK			
	New	Used	
30x3 ..	\$ 7.25	\$5.50	34x4 ..
30x3½ ..	10.10	7.00	36x4 ..
32x3½ ..	10.90	8.00	36x4½ ..

All other sizes in proportion. Bargains in new and used tubes.

ACME TIRE & REPAIR CO.,  
Phone Calumet 3127  
1547 Michigan Ave., Chicago

## SPECIAL PURCHASE!

1,000 grey inner tubes. New stock, not old or patched. All sizes from 28-3 to 37-5, \$1.25 while they last.

TIRE SALES CO., 931 Main St., Buffalo, N. Y.

## TIRES

SEND FOR OUR NEW CO-OPERATIVE PLAN  
Our plan shows YOU how to get YOUR tires and tubes

## FREE OF CHARGE!!!

3500-Mile PRINTED GUARANTEE of actual service with every tire. Send for YOUR copy. State size you use. Write now—RIGHT NOW.

TUXEDO AUTO TIRE EXCHANGE  
596E Eighth Ave., New York City

## WELDING

### Absolutely Guaranteed Welding

We absolutely guarantee all work done by the OXWELD PROCESS of welding and cutting, including welding cracked or defective cylinders, crankshafts, housings, aluminum crank and transmission cases, etc., etc. Estimates furnished on job and contract welding and cutting of all kinds.

OXWELD ACETYLENE COMPANY  
36th St. and Jasper Pl. Chicago, Ill.

### Advance Welding Machine Co.

Welding of all kinds of metals. Cast iron and aluminum a specialty.  
525 W. Jackson Blvd. 111 N Desplaines St.  
Phones: Monroe 3937; Auto 36-192. Chicago, Ill.

Almost any metal broken you can have made good as new by a

## "VULCAN"

Oxy-Acetylene Welding and Cutting Plant. Not the cheapest, but most efficient known. Highest grade apparatus with special patented features.

## \$100.00 and Upwards

Write today for book "A" on welding.

VULCAN PROCESS COMPANY  
Minneapolis, Minn. Cincinnati, Ohio

## AMERICAN WELDING CO.

2637 Michigan Ave., Chicago  
Autogenous welding of all metals, such as crank cases, cylinders, etc. We positively guarantee all work. Tel. Calumet 3563.

## Autogenous Welding

Expert welders on automobile parts. Manufacturer of reliable welding plants. Get our price and description of welding plant and carbon removing outfit for repair shops and garages.

## C. SORENSEN

18 East 16th Street Chicago, Ill.

## Expert Welding and Machine Work

Cylinders Rebores and Reground, New Pistons and Rings fitted, Broken and Worn Parts reclaimed and duplicated. Electrical Repairs and Model Work.

KENNEY-COLWELL CO.,  
Norfolk, Nebr.

## WELDING

Cylinder crankcase and crankshaft welded. Cylinders rebored, \$7 to \$11 a cylinder, including piston, 8 rings.

STERLING ENGINE COMPANY  
331-333 S. Clinton Street Chicago, Ill.

## WANTED---AGENTS & SALESMEN

AGENTS AND DEALERS WANTED  
To handle our new \$3.00 Guaranteed Electric Horn. 5½" diaphragm, loud, clear tone. Exclusive territory to live agents.  
A. E. SANFORD, 346 Federal St., Rochester, N. Y.

Exclusive and Side Line Salesmen  
for spark plugs and accessories. Well established. Good chance for right man.

## STURDY MFG. CO.

2637 Michigan Ave. Chicago

All Salesmen wanted to sell M-E OXYGEN GENERATOR, latest device for cleaning carbon from auto cylinders and do Oxygen Acetylene Welding, generating your own Oxygen. Price low, Big seller, Good profits. Fisher, Richards & Todd, Hazleton, Pa.

## MISCELLANEOUS

### We Are Constantly in Touch

with employers requiring High-Grade Engineering service. Are you listed with the  
TOLEDO ENGINEERING AGENCY  
Toledo, Ohio.

## FOR SALE

### Completely Equipped Factory

Suitable for the manufacture of cyclecar or small motors or accessories. This is a practically new outfit, will stand close inspection and will be sold at a bargain if taken at once. Will furnish detailed list of equipment upon request.

Address Box E 135, care Motor Age.

## IF YOU TRY ONE YOU WILL WANT MORE Critchley's Expanding Reamer



Reams  
Odd-Sized  
Holes

CHADWICK & TREFETHEN, PORTSMOUTH, N. H.



## SPROCKETS

Chains and Differential  
IN STOCK OR ORDER

SEND FOR NEW CATALOG  
CULLMAN WHEEL COMPANY  
1341 Altgeld Street Chicago

# Polarine

FRICITION REDUCING MOTOR OIL

Maintains the correct lubricating  
body at any motor speed or heat

## STANDARD OIL COMPANY

(AN INDIANA CORPORATION)

# Classified Advertising

Rate 25¢ a Line

## Cars For Sale

**FOR SALE—FIVE-PASSENGER OVER-**land car, 1912-1913 model, in good condition all round, tires, top, curtains and full set of tools. A bargain, \$600. A. F. Lide, Box 50, Ellmore, S. C.

**FOR SALE—USED AUTOMOBILE, ONE** seven-passenger Stoddard-Dayton, complete equipment, good price to an early buyer. 701 North Main, Bloomington, Ill.

**FOR SALE—SEVEN-PASSENGER 1913** Rambler Greyhound. Big snap if taken at once. Address Dunning & Dunning, Alworth Bldg., Duluth, Minn.

**FOR SALE—1914 WINTON SIX, RUN ONLY** 5,000 miles. Completely equipped. New over-size tires. No trade. Theo. D. Abeles, Little Rock, Ark.

**MODEL O WHITE CHASSIS, WITH TOUR-**ing body, top, shield, lights, tires. All in good condition. \$200. Box 38, Osgood, O.

**NEED OF MONEY MAKES SACRIFICE** necessary. Thomas Flyer, Model "K," 6 cylinder, 70 horsepower, 1912, rebuilt, re-finished by Kimball; new tires, luxurious 7-passenger body, color maroon, upholstery to match. Any reasonable offer will be accepted. Car cost \$6,000. Address Box E 130, care Motor Age.

**RACE CAR—281 CU. IN., 85 M. P. H.;** cheap. Sheridan, 3306 Park Ave., Ind'n'p'lis.

## Cars Wanted

**FINE BUILDING LOT IN FAIRBURY,** Neb., to exchange for automobile; value \$350. What have you? Frank W. Ellsworth, Endicott, Neb.

**WANTED—LATE MODEL AUTO AND** cash for my equity in 320 acres splendid pasture or hay land in Greeley County, Nebraska; price \$30.00 per acre; mortgage, \$4,000. Address H. C. Van Horne, Pawnee City, Neb.

**WANTED—TO BUY A 1913 MODEL SEC-**ond hand Ford automobile. Owensboro Shovel & Tool Co., Owensboro, Ky.

## Parts and Accessories WANTED

**WANTED—A THOMAS SURREY (TOR-**pedo) Body, 1912 style, upholstered, second hand, cheap. Give description. Lock P. O. Box 822, Greenport, L. I., N. Y.

**MATHESON—REPAIR PARTS. STOCK OF** over \$100,000. Repair parts for all models Matheson cars, kept fully sized up. Some unusual opportunities in used cars. Frank F. Matheson, Matheson Plant, Wilkes-Barre, Pa.

## Help Wanted

**A GOOD, LIVE AND RESPONSIBLE CAR-**buretor Manufacturing Company wants to communicate with a first-class carburetor engineer; none but a first-class man need reply. Address Box E 131, care Motor Age.

**SALESMEN—ONE OF THE FOREMOST** manufacturers of high class motor cars desires the services of two capable men to travel middle west and southern territory.

We want primarily business men capable of getting agents and holding them, men with experience in this territory preferred. A clean, successful past record will add materially to the chances of the applicant.

This is an excellent opportunity for a man of force and personality, capable of cleanly presenting a good, high class business proposition. Address Box E 138, care Motor Age.

**SALESMAN—ONE WITH FACTORY AND** jobbers' acquaintance to travel west of Chicago to handle a well known accessory line that is already strongly used by most all the jobbers and a great many cheap car builders. Man must be a top-notch or don't answer. Give reference and salary expected. This is a splendid opportunity for a good man. Address Box E 141, care Motor Age.

**SALESMAN—TRUCK EXPERIENCE PRE-**ferred; good salary or commissions; references required. Campbell Mfg. Co., M211 Dwight Bldg., Jackson, Mich.

## Situations Wanted

**EXPERIENCED CHAUFFEUR WISHES** position with private family, willing to do anything around house; can furnish good reference. Write M. D. Dudley, 1740 Spear-ing, Jacksonville, Fla.

**YOUNG MAN (29 YEARS AGE), NINE** years' experience in accessory, tire and automobile business; lately branch manager of well-known tire company, wishes position of trust, such as purchasing agent, district manager, or foreign representative. Apply Box E 140, c/o Motor Age.

**WANTED—A POSITION AS CHAUFFEUR** by a competent man; 2 years in repair shop, coupled with an I. C. S. course. Private car preferred. Arizona or California preferred. Address W. T. C., Box 753, Corpus Christi, Tex.

**WANTED—POSITION AS PURCHASING** agent. Fourteen years' experience in all branches of manufacturing. Past nine years specialized in purchases only. Best of references. Address Box E 128, care Motor Age.

**WANTED—POSITION, REPAIR MAN,** capable of taking charge of shop; the man to build up a garage; temperate; don't use tobacco. Satisfaction guaranteed. Address Box E 139, c/o Motor Age.

## Business Opportunities

**FOR SALE—ONLY GARAGE IN PLACE—**1000. 70 machines. Completely equipped machine shop. New Building, ground and tools for \$2,700. Address Box E134, c/o Motor Age.

**FOR SALE AT A BARGAIN—ONE OF THE** best locations for a garage and sales-room in Ohio. Building two stories, 175x45, over 15,000 sq. ft. of floor space. Ford Agency, large auto livery and accessory business; no better opportunity ever offered. Reason for selling retiring from business. Address Box E 101, care Motor Age.

**FOR SALE—GARAGE AND COMPLETELY-**equipped shop, tools, building and ground, in northern Illinois town near Chicago. Two good car agencies. Best location, splendid new building. Part cash and opportunity allowed to pay balance out of earnings. An opportunity for reliable party with ability and knowledge of business. Address Box E 137, c/o Motor Age.

**FOR SALE—GARAGE AND SALESROOM** at public auction; the best location at Rockford, Illinois. Sale to close mortgage, Monday, June 29th. Inquire Rockford Sales Co., 310 W. State, Rockford, Ill.

**FOR SALE—ONE OF THE BEST OF FOUR** garages in the city of Anaconda, Montana. 12,000 people. Now doing good business. This includes building 50x140. Fire proof, machine shop and tools, stock of accessories, etc. Garage fixtures of all kinds. A splendid chance for a mechanic and salesman. Price \$9,500. \$6,000 will handle. Write M. A. Fulmore, Anaconda, Mont.

**PATENTED AUTOMOBILE IMPROVE-**ments open for manufacturing and foreign patents. They are simpler devices, reliable, convenient and cheaper; designed by an experienced automobile engineer. 1. A sheet metal accessory to sell \$1.80. 2. A machine job to sell at \$1.20. 3. One is very promising to revolutionize automobile transmission and rear axle. Requires about \$8,000 for development. Write Box E 122, Motor Age.

## Miscellaneous

**WANTED—FOLLOWING ISSUES OF MO-**tor Age: 1906, January 4th, February 15th, March 15th and 29th, September 13th and 27th, December 6th; 1910, January 20th, March 24th, June 2d and 9th, July 28th, August 25th, September 1st, 8th and 29th; 1912, August 1st. Quote lowest price. J. I. Case T. M. Co., Advertising Dept., Racine, Wisconsin.

## Hoyt Electrical Instrument Works

Makers of

## HOYT AMMETERS AND VOLTMETERS

Penacook,

New Hampshire

## The Automobile HAND BOOK

NEW EDITION

By L. ELLIOTT BROOKES

Assisted by Other Well Known Experts

(41)

PRICE, \$2.00

The Class Journal Co., 910 S. Michigan Ave., Chicago

## SUPPLIES

Dealers, send for our 1914 catalogue, just out. New goods, new prices, prompt shipments. A few Fisk casings, 36x4, O. D. Clincher Heavy Car Type, at reduced prices, while they last.

CHICAGO AUTOMOBILE SUPPLY HOUSE  
1355 S. Michigan Blvd., Chicago, Ill.

## THE AUTOMOBILE CATECHISM

The book for every motorist

Now on sale for \$1.25

Regular price \$2.50

FOR FURTHER PARTICULARS WRITE

THE CLASS JOURNAL CO.

910 S. Michigan Avenue

Chicago



You cannot run your car with any old air pressure in the tires and expect the tires to last.

Tires are built to withstand a definite and specified air pressure.

You can only get maximum service when you inflate them to the exact air pressure needed, and maintain that specific pressure at all times.



# SCHRADER

## ONE DOLLAR

invested in the purchase of a **SCHRADER UNIVERSAL TIRE PRESSURE GAUGE** will save you hundreds of dollars for new tires.

For Sale by Tire Mfgs., Jobbers, Dealers, Garages or

**A. SCHRADER'S SON, Inc.**

783-791 Atlantic Ave.

Brooklyn, N. Y.

## "WHITNEY" Silent Chains

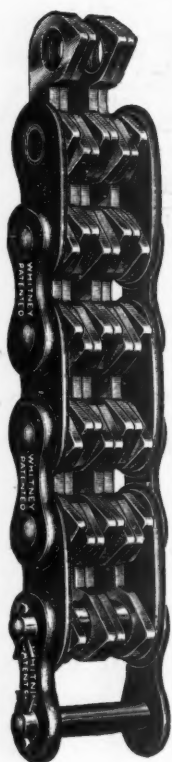
For driving Cam Shafts, Magnetos, Lighting Systems, Generators, Pumps, Self-Starters, etc.

If you are contemplating the use of silent chains, don't fail to try the "Whitney." We have made chains for years and have the most complete and modern factory of its kind in the country.

We have completed a large addition to our factory and are now prepared to make prompt delivery.

Send for catalog D, it contains useful data and information for engineers and designers.

**The Whitney Mfg. Company**  
Hartford, Conn.



# Index to the

## A

Alma Motor Truck Co. .... 106  
Atlas Auto Supply Co. .... 1  
Atwater Kent Mfg. Works. 101  
Automobile Supply Mfg. Co. 66

## E

Eisemann Magneto Co. .... 72

## F

Fedders Mfg. Co. .... 80d  
Federal Rubber Mfg. Co. ... 105  
Ferro Machine & Foundry Co. .... 80a  
Firestone Tire & Rubber Co. 80b  
Ford Motor Co. .... 103  
Forest City Elec. Co. .... 97

## B

Bartholomew Co. .... 90  
Benham Mfg. Co. .... 104  
Bosch Magneto Co. .... 77  
Braender Rubber & Tire Co. 100  
Brennan Motor Mfg. Co. ... 105  
Bresler-Wallace Sales Co. ... 102  
Brietson Mfg. Co. .... 103  
Bridgeport Brass Co. .... 102  
Briggs-Detroit Co. .... 102  
Broderick & Baseom Rope Co. .... 99  
Brown Co. .... 101  
Buda Co. .... 88  
Byrne, Kingston & Co. .... 105

## G

Gabriel Horn Mfg. Co. .... 91  
Golden, Belknap & Swartz Co. .... 100  
Goodrich, B. F., Co. .... 104  
Gould Storage Battery Co. ... 94  
Gray & Davis. .... 4

## C

Cartercar Co. .... 103  
Century Electric Car Co. ... 73 to 76  
Century Foundry Co. .... 93  
Chadwick & Trefethan. ... 112  
Chalmers Motor Co. .... 48  
Champion Spark Plug Co. ... 81 to 84  
Chandler Motor Car Co. ... 50-51  
Chase Motor Truck Co. .... 98  
Chicago Automobile Supply House ..... 113  
Classified ..... 113  
Clearing House ..... 107 to 112  
Connecticut Tel. & Elec. Co. 106  
Continental Motor Mfg. Co. 101  
Corbin Screw Corporation. ... 115  
Coreoran Lamp Co. .... 101  
Cox Brass Mfg. Co. .... 101  
Cullman Wheel Co. .... 112

## H

Ham, C. T., Mfg. Co. .... 103  
Hartford Suspension Co. ... 2  
Haynes Automobile Co. .... 100  
Haywood Tire & Equipment Co. .... 92  
Heinze Elec. Co. .... 100  
Herz & Co. .... 99  
Hicks, H. W., Brush Co. ... 89  
Holley Bros. .... 106  
Hotel McAlpin ..... 95  
Houk Mfg. Co. .... 104  
Hoyt Electrical Instrument Wks. .... 113  
Hupp Motor Car Co. .... 87  
Hyatt Roller Bearing Co. ... 105

## I

Inter-State Motor Co. .... 104

## D

Dayton Rubber Mfg. Co. ... 100  
Detroit Steel Products Co. ... 100  
Detroit & Cleveland Navigation Co. .... 98  
Double Fabric Tire Co. .... 95  
Duff Mfg. Co. .... Cover

## K

K-W Ignition Co. .... 52  
Kimball Tire Case Co. .... 101  
King Motor Car Co. .... 68  
Kissel Motor Car Co. .... 85  
Knox Motors Co. .... 103



# Advertisements

## L

Laidlaw Co. .... 106  
 Leece-Neville Co. .... 105  
 Lexington-Howard Co. .... 102  
 Lincoln Highway Assn. .... 96  
 Lovell-McConnell Mfg. Co. 47

## M

McCadden Machine Wks. ... 94  
 McQuay-Norris Mfg. Co. ... 67  
 Manzel Bros. Co. .... 93  
 Master Carburetor Co. .... 103  
 Maxim Silencer Co. .... 92  
 Maxwell Motor Co. Back Cover  
 Mayo Mfg. Co. .... 89  
 Mercer Automobile Co. .... 101  
 Metal Specialties Mfg. Co. 97  
 Metz Co. .... 60-61  
 Moline Automobile Co. 53 to 56  
 Mosler, A. R., & Co. .... 78-79  
 Motsinger Device Mfg. Co. 98

## N

New Departure Mfg. Co. ... 90  
 N. Y. & N. J. Lubricant Co. 100  
 Nordyke & Marmon Co. .... 106

## O

Owego Car Co. .... 105

## P

Packard Motor Car Co. .... 116  
 Paige-Detroit Motor Car Co. 101  
 Partin Mfg. Co. .... 62-63  
 Pederson Lubricator Co. .... 99  
 Pennsylvania Rubber Co. ... 86  
 Perfection Auto Starter Co. 103  
 Premier Motor Mfg. Co. .... 106  
 Prest-O-Lite Co. .... 103

## R

Regal Motor Car Co. .... 80  
 Republic Rubber Co. .... 100  
 Richard Auto Mfg. Co. .... 102  
 Rutember Motor Co. .... 106

## S

Salisbury Wheel & Mfg. Co. 102  
 Schrader's, A., Son. .... 114  
 Searchlight Gas Co. .... 104  
 Shaler, C. A., Co. .... 105  
 Sheldon Axle Co. .... 64-65  
 Sparks-Withington Co. .... 69  
 Spicer Mfg. Co. .... 104  
 Splitdorf Electrical Co. .... 99  
 Standard Oil Co. .... 112  
 Standard Welding Co. .... 70  
 Star Ball Retainer Co. .... 102  
 Stewart-Warner Speedometer Corp. .... 58-71  
 St. Louis Electrical Works. 96  
 Stromberg Motor Devices Co. .... 106  
 Studebaker Corp. .... 45  
 Stutz Motor Car Co. .... 80c

## T

Tokheim Mfg. Co. .... 57  
 Twitchell Gauge Co. .... 105

## U

Underwood Typewriter Co. 91

## V

V-Ray Co. .... 98  
 Vulcan Mfg. Co. .... 102

## W

Ward Leonard Electric Co. 104  
 Warner Gear Co. .... 96  
 Weston Electrical Inst. Co. 96  
 Wheeler & Schebler. .... 46  
 Whitney Mfg. Co. .... 114  
 Willard Storage Battery Co. 49  
 Willys-Overland Co. .... Cover  
 Winton Motor Car Co. .... 104

## Z

Zenith Carburetor Co. .... 88  
 Zip Cyclecar Co. .... 59

## With Baker from Coast to Coast

### The

# ORBIN-BROWN

## SPEEDOMETER

"The Speedometer of Absolute Accuracy"

Springfield, Mass., May 20, 1914.

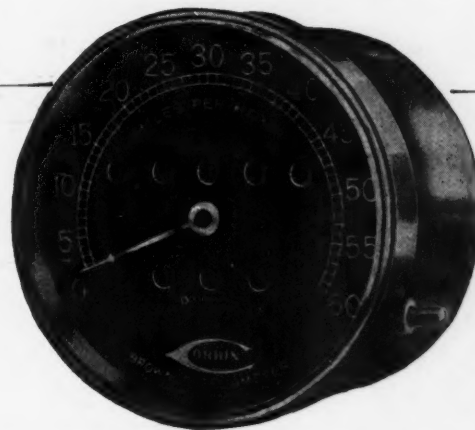
Corbin Screw Corp.,  
 New Britain, Conn.

Gentlemen:—

Your speedometer, which was attached to my Indian Motorcycle, was one of the factors which aided me in crossing 1,027 miles of hot, sandy desert, insuring me against losing my trail; in climbing the mountains where I passed through 3 in. of snow; fording streams, and over muddy, rough roads; I found it telling me the tale of how I was diminishing the distance I had to go, and how fast I was accomplishing my task.

I cheerfully recommend it, especially to the man who desires to beat my record of 11 days, 12 hours, and 10 minutes.

Very truly yours,  
 (Signed) E. G. BAKER.



That service that the Corbin-Brown Speedometer gave to E. G. Baker and is giving every day to automobilists and motorcyclists all over the country it can give to you.

There is no stronger or more simple mechanism made than that of the Corbin-Brown.

Its flexible shafting is best adapted to absorb the jars and strain of the road, to minimize friction and reduce wear.

Its centrifugal principle has been proven correct both on the road and in rigorous tests in government laboratories.

The Corbin-Brown Automobile Speedometer furnishes the same high degree of accuracy and durability as does the Corbin-Brown Motorcycle Speedometer.

At all times, under any conditions the automobilist may depend upon it to give not only an unerringly accurate register but to be of lasting service.

Investigate the Corbin-Brown and you will specify it.

Write Today for Catalog

## The Corbin Screw Corporation

THE AMERICAN HARDWARE CORPORATION  
 Successors

New Britain, Conn.

BRANCHES: New York, Chicago, Philadelphia

# Packard

## QUALITY IN MOTOR TRUCKS

Performance on the road is the best evidence of Packard ability to meet the requirements of practically all branches of heavy duty hauling.

Packard trucks are in successful operation in 185 lines of business. Many of these vehicles have been in service for periods longer than five years.

## WE ARE THE WORLD'S LARGEST BUILDERS OF MOTOR TRUCKS

From Maine to California, Packard trucks are supplanting wasteful methods with system and speed. More than four million dollars worth of Packard trucks were bought in the last fiscal year, and the current year's sales are slated to exceed that figure. Packard trucks are sold at a price consistent with the cost of the finest materials, developed by expert craftsmen under the supervision of specialists in truck design.

2-TON	3-TON	4-TON	5-TON	6-TON
\$2800	\$3400	\$3550	\$4150	\$4300

CHASSIS PRICES F. O. B. DETROIT

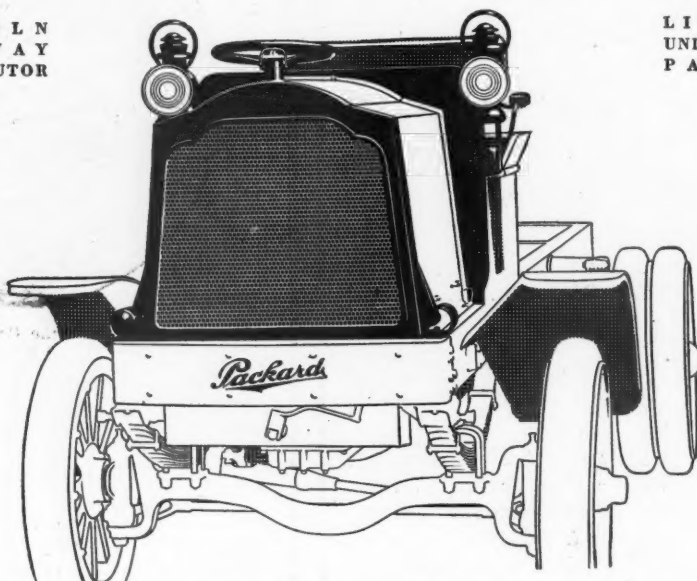
The Packard truck's ample factor of safety is assurance of uninterrupted operation, which means the maximum dividends from the investment.

In truck operation, final cost is more important than first cost. Our patrons know that the best is the cheapest when you measure the final cost.

## PACKARD MOTOR CAR CO., DETROIT

LINCOLN  
HIGHWAY  
CONTRIBUTOR

LICENSED  
UNDER KARDO  
PATENTS



## ASK THE MAN WHO OWNS ONE

**Y**OU know the old story about the barking dog.

Well—a great many automobile valuations are marketed on the same basis. A lot of loud talking is done—but when the air clears and you happen to ask several pointed and practical questions (as for instance the length of the wheel base, horsepower, kind of upholstery, etc.,) the talk becomes very indistinct and faint.

The more you ask questions about the Overland and the more you compare the answers with corresponding points of other cars, the more you are impressed with the integrity and unusual value of the

# Overland

**\$950** Completely equipped

**\$1075** With electric starter and generator

Prices f. o. b. Toledo, Ohio

**BRIEF SPECIFICATIONS:**

Electric head, side  
tail and dash lights  
Storage battery

35-horsepower motor  
33 x 4 Q. D. tires  
114-inch wheelbase

Mohair top, curtains  
and boot  
High-grade speedometer

Clear-vision, rain-  
vision, windshield  
electric horn

**The Willys-Overland Company, Toledo, Ohio**

*Manufacturers of the famous Overland Delivery Wagons, Garford and Willys Utility Trucks. Full information on request.*



# Maxwell "25" \$750.



Away from the sultry towns and cities to cool, shady regions thousands of happy families go in their swift, smooth-running MAXWELLS.

Health, comfort and happiness may be obtained from a MAXWELL "25" \$750—the motor car of real worth, of economic upkeep—the big, beautiful, streamline, 5-passenger family automobile—the world's greatest value at its price. See the MAXWELL dealer in your town and let him take you riding in a MAXWELL "25" \$750 Car.

You will be delighted.

MAXWELL MOTOR COMPANY, Inc.  
DETROIT MICH.

